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OLUME 32, No. 14

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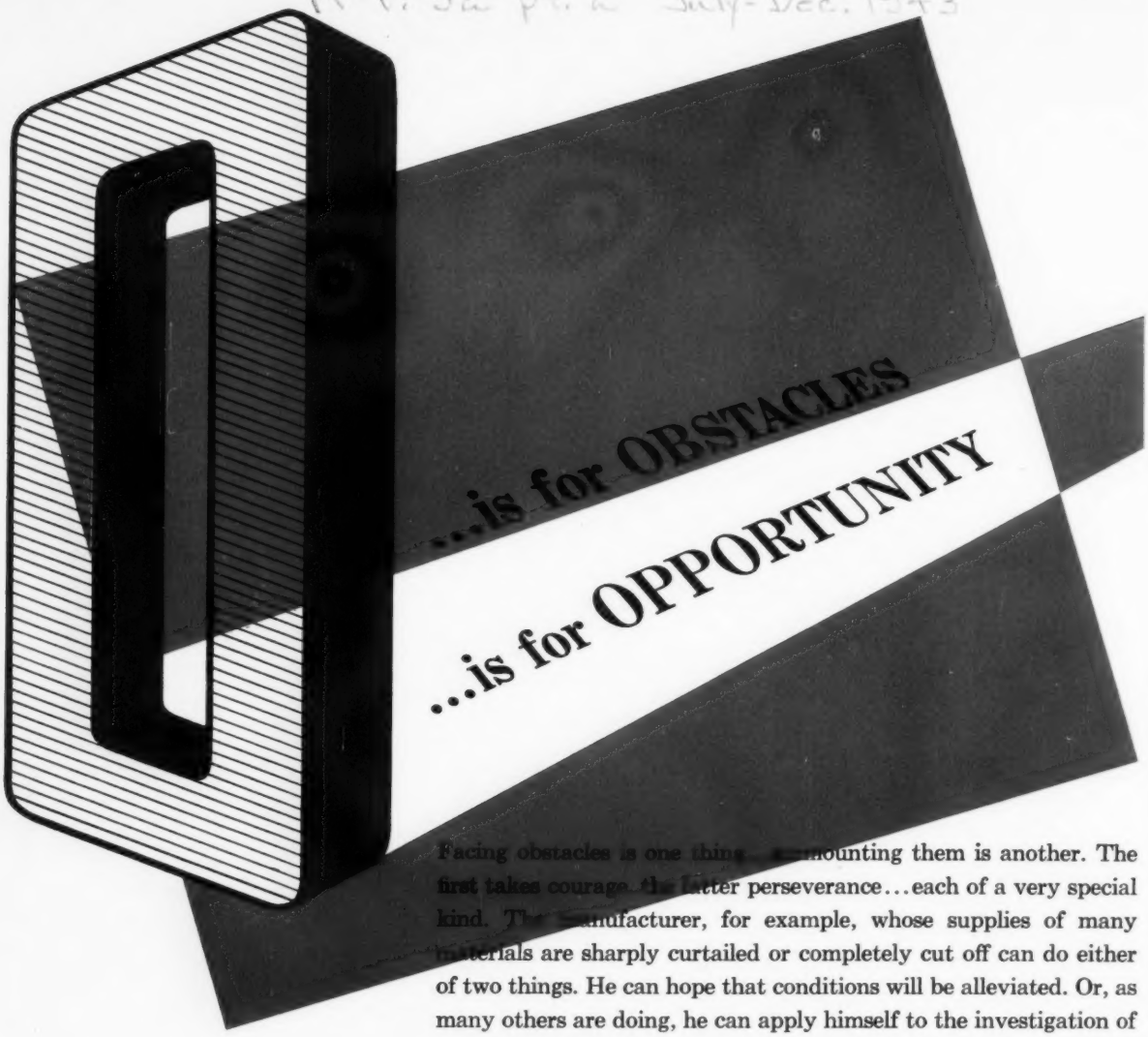

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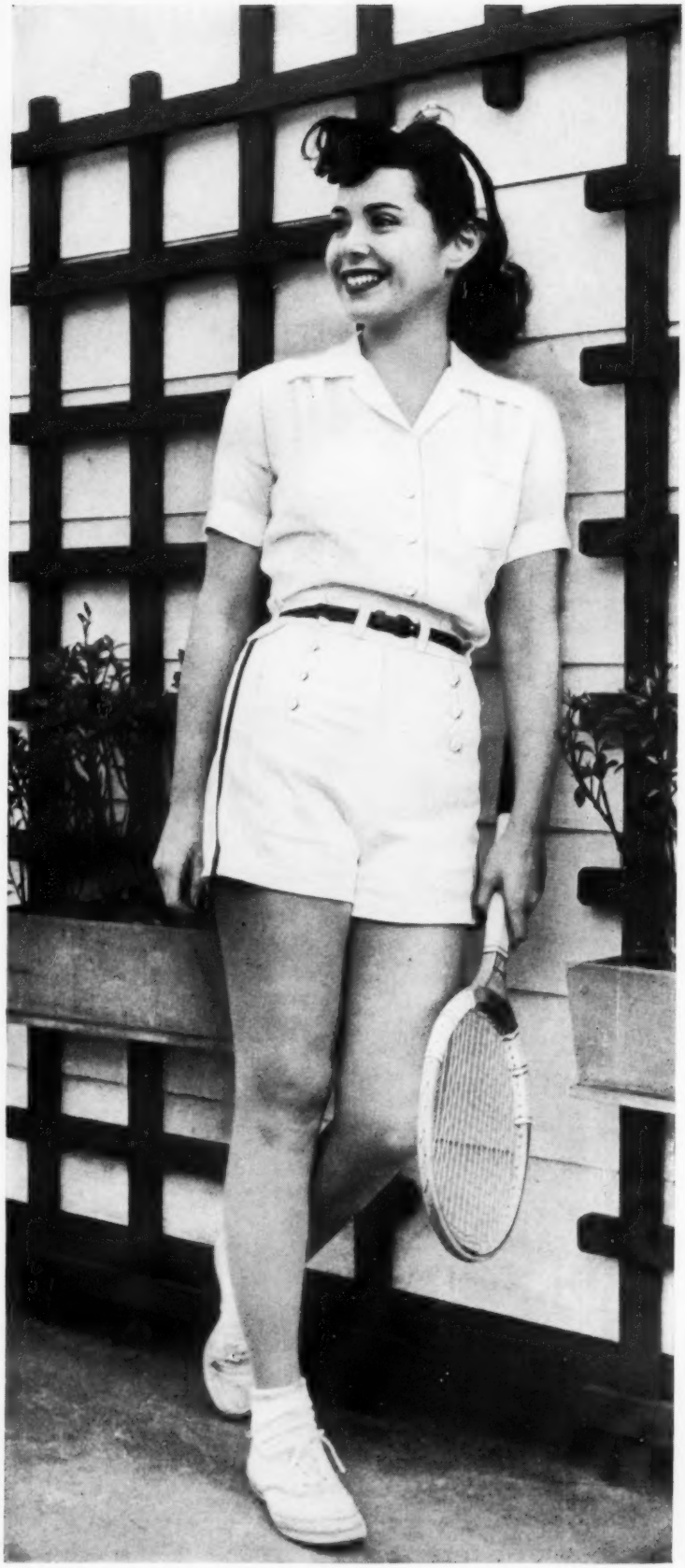

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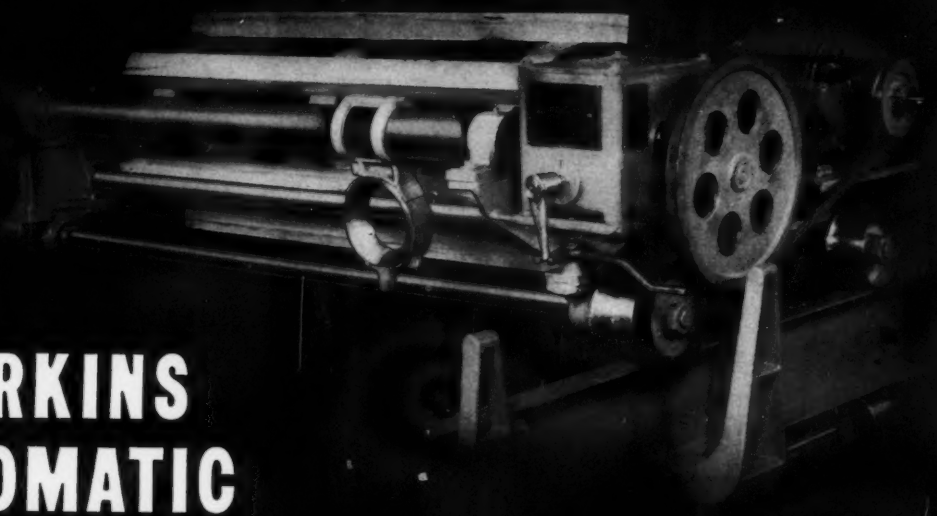

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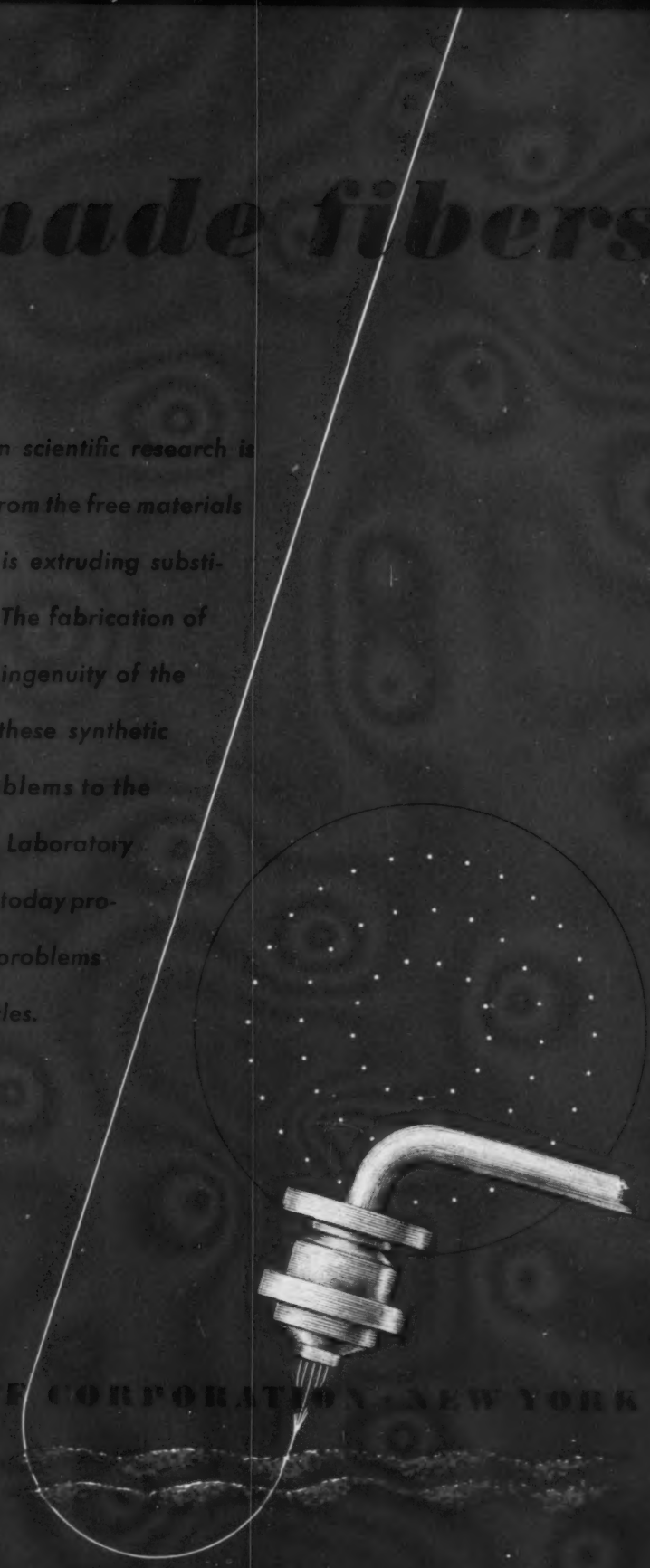

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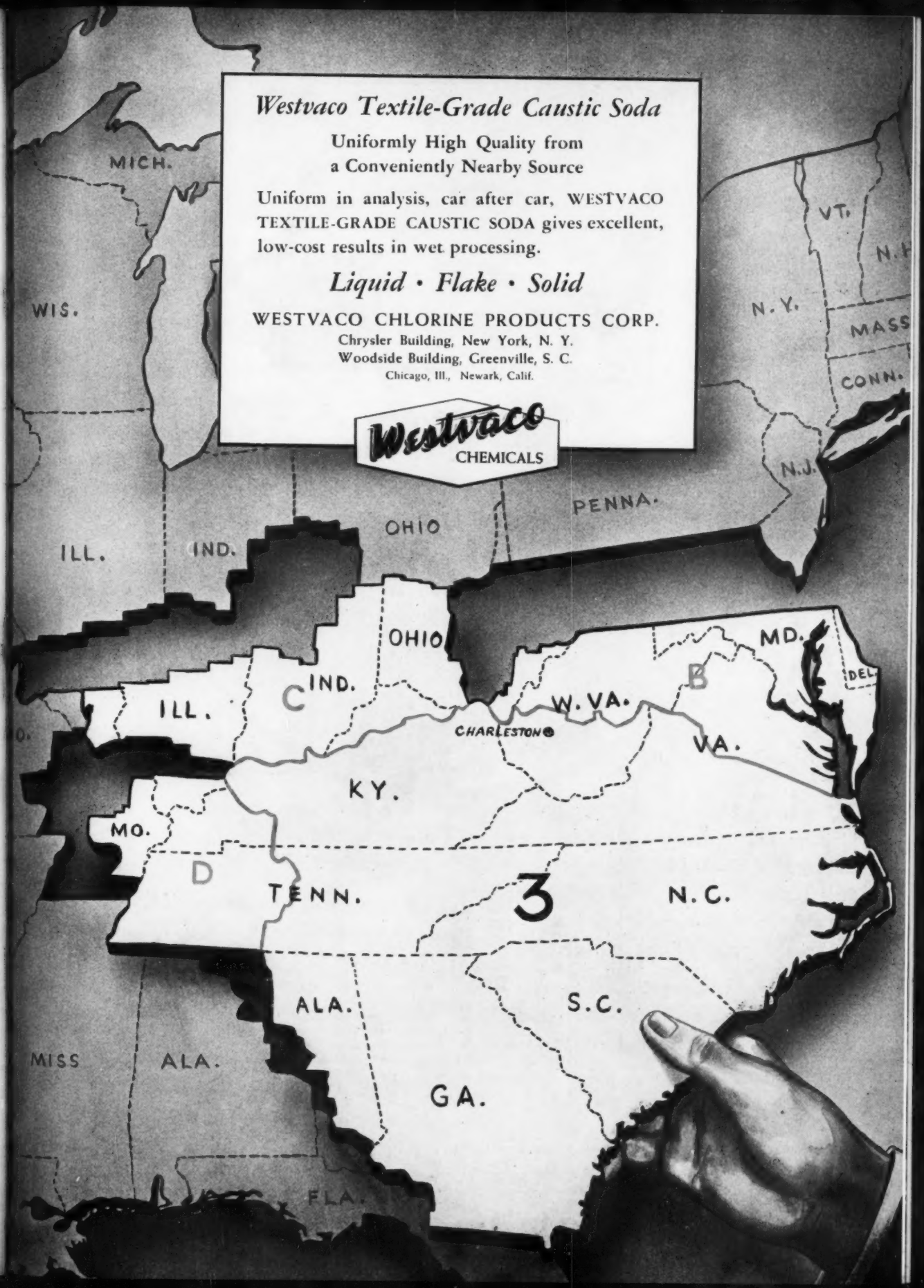
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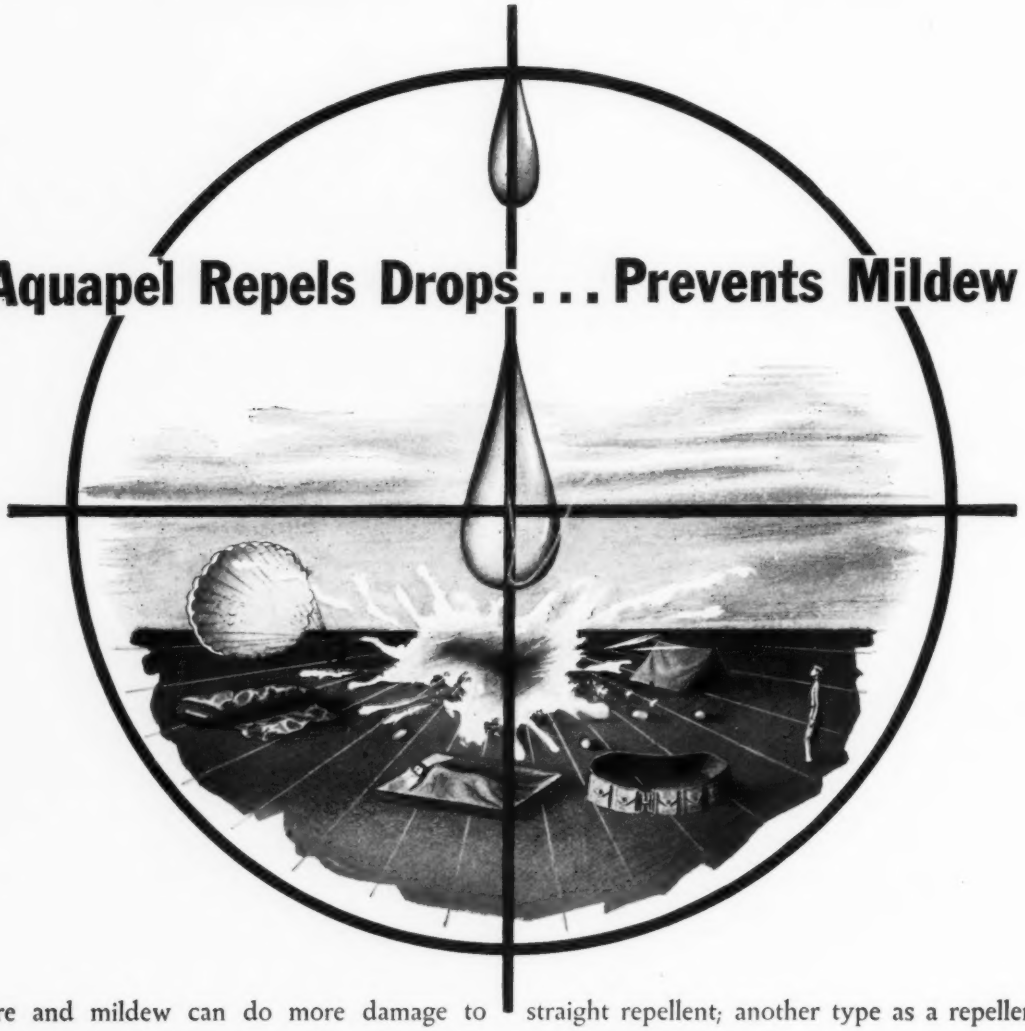

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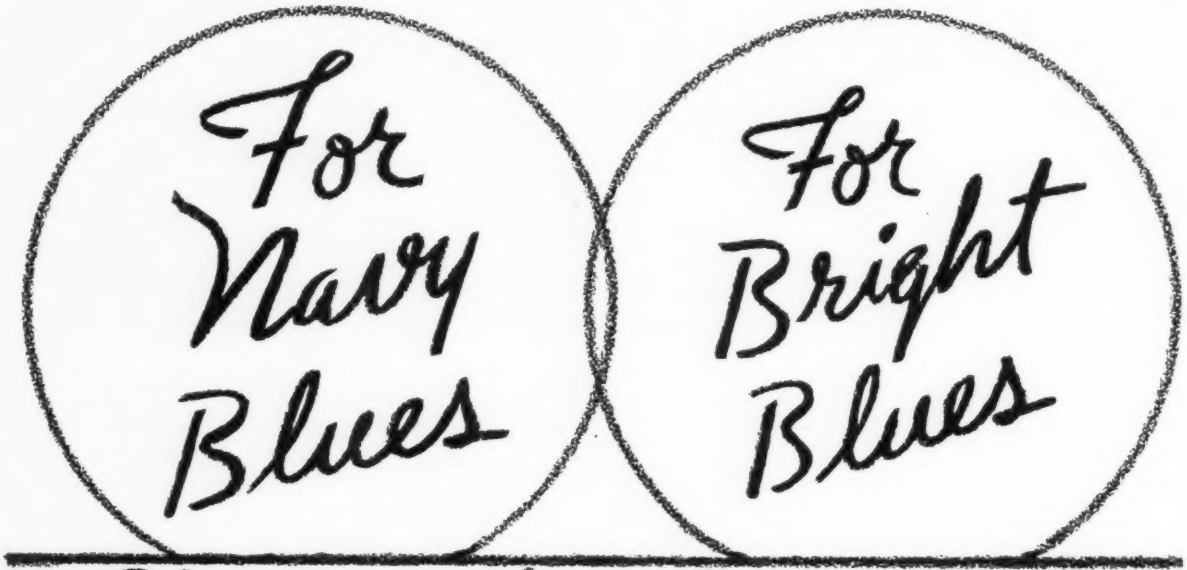

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AMERICAN
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VOLUME 32 JULY 5, 1943 NUMBER 14

FIREPROOFING

Cotton and Woolen Fabrics

MAJOR ROBERT VAN TUYLE
C.W.S. Development Laboratory, M.I.T., Cambridge, Massachusetts

ABSTRACT

A satisfactory method of fireproofing cotton and woolen fabrics has been developed by the Chemical Warfare Service. The treatment consists of impregnating the fabric with a dispersion of antimony oxide (Sb_2O_3) in a methyl ethyl ketone solution of Vinylite VYHH, drying and finishing. When placed directly in a flame, fabric treated in this way will char but will not flame or burn. The fire-resistant properties of the fabric are not affected by washing or dry cleaning. The tensile strength and aging characteristics of the cloth are not materially affected by the treatment.

INTRODUCTION

THE purpose of this article is to disseminate information and experimental facts obtained at the Chemical Warfare Service Development Laboratory regarding the preparation of fire-resistant fabrics in the hope that it may assist in the protection of workers in incendiary plants, refineries, steel mills, etc.

For many years it has been more or less standard practice to impart fire resistance to draperies, curtains, etc., especially those used in public meeting places. In most cases water-soluble salts such as phosphates, borates and sulfamates have been used since resistance to laundering or dry cleaning was not important. Tin compounds have also been used to impart fire resistance, especially to cotton fabrics. In most cases fabrics so treated had a fair degree of wash resistance. Tin in the form of the tungstate also has been suggested as having suitable properties for such uses.

The problem presented to the C.W.S. Development Laboratory was to develop a treatment for cotton or woolen fabric which would produce a fabric having the following properties:

a. Resistance to fire.
b. Resistance to laundering.
c. Resistance to dry cleaning.
d. Porosity similar to untreated fabric.
e. Hand, drape and strength similar to untreated cloth.

Factors of major consideration in the development of such a process were:

a. Low cost.
b. Use of nonstrategic and noncritical materials.
c. Adaptability of process to existing equipment.

DEVELOPMENT OF FIREPROOFING PROCESS

In the initial work on this problem, attempts were made to impregnate fabric with a water-soluble salt, applying a suitable overcoat to impart shower and laundering resistance. All efforts along this line were unsuccessful due to the failure of the coatings to prevent the leaching action of the water on the soluble salts. Since it was necessary, in view of present shortages, to consider only materials which were available within the United States in sufficient quantities for such purposes, tin compounds were not considered.

A large number of chlorinated organic materials were tried alone as fireproofing agents, but, in no case, was it possible to impart sufficient fire resistance without excessive increase in weight of the fabric.

Efforts were made to use water-insoluble salts either deposited in the fabrics by precipitation or held on the fabric by a binder. Of the materials investigated, antimony oxychloride appeared to be the most promising from the consideration of fire resistance alone. However, it is difficult to precipitate this material in the fibers and, moreover, the compound is unstable. In humid atmosphere, especially in the presence of ultraviolet light, antimony oxychloride tends to decompose rapidly. The subsequent release of hydrochloric acid results in destruction of cotton fabrics and is generally objectionable.

In the work with antimony oxychloride, it was found that it was not necessary that the antimony and chlorine be bound together chemically; if both were present in suitable form and amount, the desired fire resistance could be obtained. Antimony oxide was found to be the most practical form in which to apply the antimony. A number of suitable compounds were available as chlorine-containing

Fire-resisting suit compared to usual type of coverall worn by workmen in incendiary plants, etc., before exposure to flames. Boards are covered with first fire powder.*

1. **(Left)—Coverall fireproofed by treating with antimony oxide and a vinylite binder.**
2. **(Right)—Coverall as worn by workmen in incendiary plants.**
3. **Boards covered by first fire powder spaced approximately 14 inches from dummy.**

*NOTE: The term "first fire powder" refers to the first incendiary mix adopted by the C.W.S.

binders. These included chlorinated paraffins, the Sarans, Koroseal, and the chlorine-containing Vinylites. Of these materials, the most suitable was the vinyl chloride-acetate copolymer which is available commercially as Vinylite VYHH.

A large number of materials were studied in attempts to find a suitable plasticizer. The most commonly used plasticizers were found to decrease the fire resistance of the materials. The aryl phosphates were not considered since they are, at present, of very limited availability. All plasticizers used imparted undesirable properties, such as decreased fire resistance, decreased washing and dry-cleaning resistance, and, when used in large amounts, a "clammy" hand. Therefore, it was decided to try to develop a treatment which did not require the use of a plasticizer.

Initial attempts using antimony oxide and Vinylite without a plasticizer produced, as expected, a very harsh, stiff fabric. However, it was found that the fabric could be softened sufficiently for its intended use by laundering and finishing after impregnation. As a result of these experiments, the following general procedure was developed and found satisfactory for the fireproofing of cotton fabrics, such as herringbone twill, enameling duck and bandoleer cloth, and either all-wool or wool-rayon fabrics:

1. *Preparation*
   Before impregnation, the cloth is desized with an appropriate desizing agent, washed and dried.
2. *Impregnation*
   Impregnation is carried out in a machine so designed that the cloth is passed continuously through a trough containing the impregnating mixture of antimony oxide and Vinylite VYHH in methyl ethyl ketone. The impregnated cloth is passed between squeeze rolls to remove excess liquid and dried in a suitable drier.
3. *Finishing*
   The finishing process consists of washing the cloth in a warm 0.2 per cent solution of soap, rinsing and drying. If desired, the finished cloth may be further softened by sanding, napping, or similar treatment.

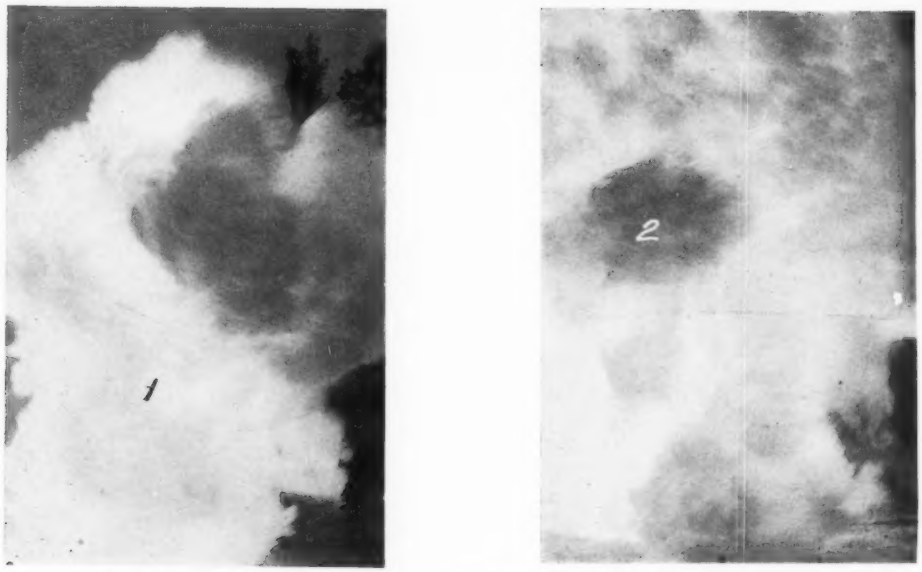
TESTS

Using this procedure, several thousand yards of fabric have been fireproofed in the laboratory and at commercial textile plants. The application on a plant scale has provided no exceptional difficulties.

To test fire resistance, samples of treated fabric, 4 inches long and 3/8 inches wide, were held in an alcohol flame until severe charring occurred. Upon removal from the flame, no continued flaming occurred in samples fireproofed by the antimony oxide-Vinylite method. It is possible to saturate this fireproofed material with gasoline and to burn the gasoline without affecting the fabric.

Tests on the fireproofed fabric indicate that there is no material loss in tensile strength, aging or weathering characteristics of the fabric.

The drape, hand and fabricating qualities of the treated



Flames from ignition of first fire powder enveloping fire resisting suit and usual type of coverall.

1. (Left)—Flame enveloping fire-resisting suit. Duration of flame, 3 seconds.
2. (Right)—Flame enveloping usual type of coverall. Duration of flame, 4 seconds.

fabric are good. Coveralls made from the fireproofed material have stood up well in normal wear and have retained their fire resistance after many launderings.

Samples of fireproofed enameling duck were laundered twelve times at a commercial laundry doing regular Army laundry work. In these washings the loss in fire resistance was negligible and the loss of impregnants small, as indicated by the data:

Original pickup	40.4%
Fire resistance	Excellent
Loss after one washing	1.8%
Fire resistance	Excellent
Loss after twelve washings	3.1%
Fire resistance	Excellent

Similarly, the treated fabric is unaffected by dry cleaning with Stoddard solvent or similar dry-cleaning agents. However, the fireproofed fabric will not withstand cleaning with chlorinated solvents.

DETAILED PROCEDURE

It is believed that the following detailed procedure for the production of fireproof fabric is adaptable for use by most textile processing and impregnating plants capable of handling inflammable solvents.

A. Materials Required

As an example, the following materials are required to treat one thousand yards of eight-ounce enamelling duck.

Desizing Operation

Soap (for wash)	50 lbs.
Water (for wash)	200 gals.

Sufficient water to rinse free of soap

Impregnating Mix

Antimony oxide	120 lbs.

Vinylite VYHH (obtainable from Carbide and Carbon Chemical Corp.) or equivalent 60 lbs.

Methyl ethyl ketone—A quantity sufficient to give a mix of suitable viscosity and optimum pickup. (The desired increase in dry weight of cloth is about 35%).

Finishing Operation

Soap (for finishing)	33 lbs.
Water (for wash)	200 gals.

Sufficient water to rinse free of soap

The quantity of impregnating mix given above must be supplemented by sufficient mixture to take care of proper immersion and unavoidable loss.

Where the white color of antimony oxide is objectionable, part of the antimony oxide may be replaced by suitable coloring pigments, matching the color of the untreated fabric.

B. Equipment

1. *Washing Machine*

The preliminary desizing operation and the finishing operation can be carried out in a standard type of washing machine. The standard beck, rope washer, open-width scourers, or laundry tumblers can be used.

2. *Mixing and Storage Tanks*

The impregnating mix can be prepared and stored in any tank which is easily cleaned and which is not lined with a material soluble in methyl ethyl ketone. Tin or glass-lined equipment is satisfactory. Iron, steel, copper, stainless steel, or monel equipment is also satisfactory. The mixing tanks should be equipped with agitators and should be vented to the outside. It is desirable to provide some means of stirring or circulating the mix in the storage tanks since the antimony oxide and pigments tend to

Fire-resisting suit as compared to usual type of coverall after both suits have been exposed to 3 to 4-second flames from first fire powder.

1. (Left)—Fire-resisting suit.
2. (Right)—Usual type of coverall worn by workmen in incendiary plants, etc.

settle. Storage tanks should be vented to the outside atmosphere. Wherever possible, the impregnating mix should be transferred by gravity flow. The use of valves and pumps should be kept to a minimum, as they will tend to clog, thereby requiring frequent cleaning.

3. *Paint Mill*

For dispersing the antimony oxide in the methyl ethyl ketone solution of Vinylite, a three-roll or five-roll paint mill is desirable. If the antimony oxide is added slowly and stirred-in without the use of a paint mill, thte mix will be satisfactory, but the antimony oxide will have a greater tendency to settle. In experimental, large-scale work at the C.W.S. Development Laboratory, commercially available antimony oxide-Vinylite VYHH dispersions (prepared by RBH Dispersions, Inc.) were used.

4. *Impregnating Equipment*

The ordinary type of size pad or jig can be used as impregnating equipment. A shallow trough is preferable, as the pigments tend to settle on standing. A combination of two rubber rolls or a rubber and a metal roll is satisfactory for the squeeze. Cloth-covered rolls cannot be used as the mix will be soaked up by this type of cover. The rolls should be cleaned frequently to prevent the mix from accumulating and drying on the rolls.

5. *Drying Equipment*

The washed, impregnated and finished cloth can be dried on any type of drier, such as clip or pin tenters, dry cans, or infra-red lamps. However, overheating and prolonged drying should be avoided. The freshly impregnated cloth should not come in contact with a felt blanket or any material which will absorb the mix. Before drying, the cloth should not be extracted by using centrifuges or vacuum slots as this would remove the impregnating material. Drying equipment should be enclosed and adequately vented to the outside if solvent recovery is not employed.

6. *Finishing Equipment*

A cotton jig or similar open-width scouring machine may be used for softening the treated fabric. Further softening may be accomplished by use of a sanding or sueding machine. This machine consists of sandpaper-covered rolls over which the fabric is pulled. Napping, shearing and steaming equipment may be used to soften woolen or wool-rayon fabric. Pressing can be performed on any type press which is suitable for cotton or woolen cloth.

7. *Auxiliary Equipment*

A solvent recovery system is desirable but not necessary. Any solvent recovery system suitable for methyl ethyl ketone is satisfactory.

If solvent recovery is not employed, adequate ventilation should be provided to insure the safety of all personnel against fire hazard and noxious fumes.

C. Fireproofing Procedure

1. *Preparation of Cloth Before Impregnation*

If the cloth contains size, remove the size by treatment with suitable desizing materials. Wash the cloth with hot water containing approximately 0.3 per cent by weight of soap to remove any extraneous material and rinse free of soap. Dry the cloth completely. If the cloth contains no size and is clean, this operation can be omitted.

2. *Preparation of Impregnating Mix*

a. General Preparation

The composition of the solids (parts by weight)

used in the impregnating mix is:

One-third Vinylite VYHH

Two-thirds antimony oxide (Sb_2O_3)

The amount of methyl ethyl ketone used will vary with the equipment. In the preparation of the mix, adjust the concentration of the mix so as to permit the fabric to retain enough antimony oxide and Vinylite, on a solvent-free basis, to equal about 35 per cent of the weight of untreated fabric.

In preparing the mix, dissolve the Vinylite in one-half the methyl ethyl ketone. Add the antimony oxide with agitation and then, if such equipment is available, put this mix through a paint mill. For use, add sufficient methyl ethyl ketone and stir the mixture well.

b. Adjustment of Pickup

In order to obtain the proper degree of fire-proofing, the finished cloth should have approximately 35 per cent pickup based on the original weight of the cloth. To determine the proper composition of the mix, or the proper setting of the squeeze rolls, a few sample pieces should be impregnated, using the following trial procedure.

Make up a small batch of mix of any known concentration. A satisfactory trial mix may have the following approximate composition:

30% (20% Antimony oxide
(10% Vinylite VYHH
70% Methyl ethyl ketone

Weigh a small piece of the cloth (e.g. one yard), impregnate it with the mix and put it through the squeeze rolls. Dry the cloth and weigh it. If the pickup (based on original weight of cloth) is above 35 per cent, increase the pressure on the rolls; if it is below 35 per cent, decrease the pressure. After adjustment of the rolls, impregnate, dry and weigh another piece to determine if the proper pickup has been obtained. If not, adjust the squeeze again. Repeat this procedure until the squeeze rolls are properly adjusted.

3. *Impregnation of Cloth*

Impregnate the cloth by running it continuously, at full width, into a trough containing the impregnating mix. Run the cloth at such a speed as to permit it to become saturated. Pass the cloth through squeeze rolls to remove the excess to return to the trough. Do not permit the cloth to stop between the trough and the squeeze rolls, as it will dry at that point and become very stiff.

4. *Drying Impregnated Cloth*

Dry the cloth by any suitable means. Since overheating and prolonged drying may cause the treated fabric to become quite stiff, particular care should be taken in drying this material. The drier should be run at such a speed that the cloth leaving the drier feels cool to the touch.

5. *Washing of Impregnated Cloth*

To soften the fabric, treat for thirty to sixty minutes on a cotton jig or similar open-width scouring machine using a 0.2 per cent solution of soap or other suitable detergents at 120° to 212° F., depending on type of material. Rinse free of soap and squeeze to remove excess liquid.

6. *Drying of Treated Cloth*

Dry the treated cloth on any suitable drying equipment. Excessive heat or prolonged drying times should be avoided.

7. *Finishing of Treated Cloth*

The cloth may be further softened, if desired, by treatment on a sanding or sueding machine. Wool and wool-rayon fabric may be softened by napping, shearing, and steaming. The finished fabric may be pressed on a suitable machine.

8. *Storage of the Finished Fabric*

No special precautions are necessary in the storage of the finished fabric, normal storage conditions being satisfactory.

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Graphical Method for Obtaining "Oven Dry" Cotton Percentages in GOVERNMENT LINING FABRICS

H. C. HALLER and ALFRED FELGENDREGER
Continental Mills, Inc.

RIGID Government specifications on lining and similar fabrics of cotton and wool composition demand close laboratory control of the cotton percentage. It is necessary in the manufacturer's interests to approach the maximum allowable cotton content without exceeding that amount in any case. Many mills are using the accepted caustic boilout method run on the "oven dry" basis[1] as the control method. This procedure consumes considerable time in just the two drying operations to obtain the "oven dry" original and final weights. When numerous tests must be made regularly, rapidity of the test completion is essential. It is the purpose of this article to suggest a graphical method for ascertaining the "oven dry" basis cotton per cent using the "in air" (rapid) caustic boilout results correlated with relative humidity data.

In the "oven dry" caustic boilout method the clean

original sample and the residual cotton are completely oven dried. The cotton per cent is calculated, following the usual 3-5 per cent additive correction to the cotton residue[2]* from the corrected "oven dry" cotton weight and the "oven dry" original sample weight. In the rapid method the original and cotton residue weights are taken under the existing atmospheric conditions. The 3-5 per cent correction is used here also. The cotton per cent, "in air" basis, is calculated from these "in air" weights.

"OVEN DRY" COTTON %

$$\text{Cotton } \% = \frac{\text{Woc}}{\text{Woo}} \times 100$$

Woc—"oven dry" cotton residue, weight, including 3-5% correction.

Woo—"oven dry" original sample weight.

"IN AIR" COTTON %

$$\text{Cotton } \% = \frac{\text{Wac}}{\text{Wao}} \times 100$$

Wac—"in air" cotton residue weight, including 3-5% correction.

Wao—"in air" original sample weight.

In collecting these data, none of the tests received any more attention than in regular routine testing of this kind. Therefore, it is felt that a shortened procedure arrived at as a result of this study will be of value with run-of-the-mill testing. There should be no critical points in testing that would be difficult to govern.

EXPERIMENTAL PROCEDURE

The materials used were from various stages of processing of the 20 ounce lining fabric which had an intended composition of 20 per cent cotton and 80 per cent wool. The data was collected as a result of control testing through these various operations. The types of samples tested were sample blends, card rovings, yarns and finished pieces.

The sample blends, card rovings, and the yarn samples were all dry cleaned with carbon tetrachloride for the removal of oil and other extraneous material. The finished cloth samples were assumed to be clean. Results of routine soxhlet extractions on this style fabric substantiated this assumption. 1 per cent of oil plus extraneous matter was the maximum amount found in this fabric.

For all but the finished cloth sample types we used 2.00 gm. samples ± .002 gm. for the caustic boilout. For the finished cloth approximately 3" squares were weighed exactly. These weights were generally between 4-5 grams.

The finished cloth samples were usually weighed soon after being received in the laboratory, although no effort was made to avoid long standing before testing. These pieces were adjusted to moisture conditions as found in the atmospheric conditions in the laboratory. The other type samples were conditioned for at least 1½ hours[3] following removal of the carbon tetrachloride left from the cleaning operation. This removal was at times done in the oven and at times in the open. The time allowed for a cotton per cent figure on a particular sample determined the manner in which this step was handled. When weighed, the samples had reached a moisture equilibrium with the surrounding air.

Shortly before or after weighing both the original sample and the cotton residue "in air," sling psychrometer readings were taken to obtain the relative humidities[4]. The air temperature was the dry bulb reading. The caustic boilout was the usual 10 min. boil in a 5 per cent solution of commercial sodium hydroxide, followed by good rinsing in tap water, neutralization for 5 min. in a dilute acetic acid solution, and a final rinse in tap water. All the oven drying was done at 105-110° C. for at least 2 hours. A few samples had as many as 15 hours oven drying. This occurred when the drying was done overnight. Following the "oven dry" residue weighing, the samples were exposed to the atmosphere for at least 1½ hours. Often more time was used; however 1½ hours was held as a safe minimum for conditioning[3].

CALCULATIONS

Very little calculation was required for the drafting of this shortened method. First we arrived at the moisture regain per cents on both the original and the cotton residue samples.

$$\% \text{ Moist. Regain} = \frac{\text{"In Air" Wt.-"Oven Dry" Wt.}}{\text{"Oven Dry" Weight}} \times 100$$

The "in air" and "oven dry" cotton per cents were obtained as described previously. All of these data along with the relative humidity per cents and air temperature are recorded in Chart I.

Graph I shows the relationship between the difference in moisture regains on original and residue samples and the difference between the "oven dry" and "in air" cotton per cents actually found. The moisture regain difference is always positive as the residue regain is subtracted from the original sample regain, which is always higher. It is a distinctive property of cotton[5] to be of considerably lower moisture regain than wool under the same temperature and humidity conditions. The approximately 80 per cent wool content of the original causes the regain of the original to be higher than that of the all-cotton residue. Relative humidity and temperature variations will influence these moisture regain values[5, 6]. An increase in relative humidity increases the moisture regains of cotton and wool. The moisture regain difference will fluctuate dependent upon the relative humidity changes. The effect of a few other factors such as hysteresis and previous history of the stocks would be comparatively small[6] and being random would tend to cancel out. We have established, using hypothetical cases, that the difference between the "oven dry" and "in air" cotton per cents would increase with an increase in moisture regain difference between the original and the residue. Relative humidity changes are compensated for in their effect upon

(Continued on page 311)

*—3 per cent for colored stock, 5 per cent for white stock.

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JULY 5, 1943

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CALENDAR OF COMING EVENTS

Annual Meeting and Dinner, Philadelphia Section, Cedarbrook Country Club, Limekiln Pike above City Line, Mt. Airy, Philadelphia, Pa., July 9, 1943.

The Dyeing of Government
ARMY AND NAVY SHADES
on Half Hose

J. VAUGHN BOONE
Geigy Co., Charlotte, N. C.

IT IS an evident fact that during war time there is always a sharp up-trend in all branches of scientific and technical development. We might attribute this to several causes, the chief one being, of course, necessity. It is the necessity of not only fighting our enemies, but of out-producing him as well, of making the most of what we have by exploiting our natural resources for the greatest national good. We Americans have the reputation of being rather dumb at times on one point—that is, we don't know that a thing cannot be done so we go right ahead and do it. New fields have been and still are being explored giving rise to many new products as well as new uses for the old ones.

We, of the dyeing and chemical field, have been especially careful to keep up with the times, even pioneered into the future, looking forward to a brighter and more abundant world when the peace is ours for keeps. Things we once thought indispensable, we've learned to do without; and in many cases, making substitutes that surpass the original. Nylon is a typical example, for through its use we pledge never to make Japan rich again with our dollars or our scrap metal. Speaking of substitutes, thank goodness, we don't have to do as Hitler does for, I am told, he drinks a substitute for substitute coffee. (I might add in passing that in light of recent developments Hitler will soon have to devise some type of substitute for an army, if he is to continue the fight.)

So "time marches on" bringing many new situations and problems with which we must deal. The dyeing of Army and Navy goods is a comparatively new thing to many of us. You have had to work out your production problems under rather trying conditions. Having lost many key men to the armed forces, you now must roll up your sleeves to dig in more and more with the detail work which, no doubt, gives you less time to devote to supervision and for thought on the problems at hand. You have been hampered by shortages, delays in delivery, unavailable repair parts, and many other things that do not make for the greatest ease of mind, nor for the greatest production. In spite of this, I know that you can be truly complimented in making the most, and the best, of the least.

I don't know that I will be able to point out anything that will give you a better understanding of the job you are doing; I certainly know of nothing phenomenal about what I have to say. But, if this should prove more than just a review of your own experiences, you may thank your neighbor dyer, for it has been in working with him in his plant, and getting his ideas, that I gleaned the information I pass on to you.

Of first consideration in any type of dyeing is the material to be dyed, the mercerized yarn in the Army summer tan and Navy black, also the 50/50 wool and cotton for the Army fatigue hose. You are surely aware that the yarn manufacturers have been confronted with somewhat the same production problems as yours, as mentioned above. The chief cause for what you might term lack of vigilance on their part, when sub-standard yarn is delivered, would be, primarily, the increased demands upon them for production to meet the needs of a nation at war. In stretching the supply to meet the demands, they have done a swell job. You may consider yourselves lucky to have any at all, and go to work making the best possible use of it.

In the case of mercerized yarn, most all of you have, at times, experienced so called "tiger stripes" in your dyeing of the Army summer tan. You have rightly attributed this to yarn differences, but it is too late to change yarn after the hose is already knitted. I have asked the yarn manufacturers for an explanation of this, and they say that it is likely caused by uneven tension as the yarn passes through the caustic mercerization bath, slack ends getting only partial mercerization. As for bettering this in the actual dyeing operation, there are a few things that appear to help, although I've never observed a case where it was completely overcome. The procedure that helps most is adhering as closely as possible to all the rules of good dyeing and may be taken as standard procedure.

First is the selection of the penetrant. There seems to be four, possibly more, prime requisites for an oil to possess. The first job of the penetrant is as a water conditioner, the scope of the action depending entirely on the quality of the water used. In some extreme cases I have observed, actual visual precipitation of the mineral salts present was advisable. You should have your water tested, unless you have an established source, in order to get an idea of just what action is needed. Secondly, quick, thorough penetration that does not lose its wetting-out potency at higher temperatures is advisable. Also scouring action is necessary to relieve the goods of grease, dirt, and all

*Presented at meeting, Piedmont Section, June 5, 1943.

foreign matter which is usually present in varying amounts. (If you have an undue amount of grease and graphite in your goods so as to cause seconds, I will be glad to give you my pet method for cutting it off the goods.) Of last consideration in a penetrant is retarding properties, which is by no means negligible, a need that ties up closely with the selection of dyestuffs and their exhaustion properties.

As for the choice of dyestuffs on this Army tan, we are very limited in our choice by the fastness requirements. If only the proper shade were required, my choice would be, by far, cheap directs that boil off and on easily, and would exhaust slowly and evenly. As you know, colors having these properties are generally poor to washing, therefore, the next best thing is to control the exhaustion by chemical means. By carefully establishing and maintaining the alkalinity of the bath, by salting slowly, using retarders, and allowing ample time for the shade to build up to bath exhaustion, better results can be obtained in every case, the yarn being the same. As for the working properties of the colors themselves, you will get this information by studying the combination you are using, or from the dyestuff concern from which you purchase your dyes.

There is another point which has caused considerable trouble, that is, the beat-out streaks. The best, and generally used practice, is to beat out in a very weak solution of the same penetrant you use in the dye bath, keeping it slightly on the alkaline side. Even this will show beat-out streaks if the damp goods are allowed to lie for any length of time, or it the goods are entered into the bath with the dye already present; especially is this true when fast exhausting colors are used. You can readily see that the color would start feeding on the wet portion with the dry part holding back for several minutes. A practice I have found quite good is to wet out goods before adding the dye at about 120° F., and in cases where the goods have been beat out for some time, let them run a few minutes at 120° F. before you add your regular penetrant. This unsaturated water bath will pull the excess penetrant off the wet portion giving a much more uniform wet out. This beat-out problem is not experienced by the dyers on the Navy black as the color masks any differences that might be present.

All of you that dye the Navy black are familiar with the situation there. You know that unless you were well stocked, you had to give up your developed black. If it takes giving up dyes and developers to get enough TNT to blast our enemies, we will all be glad to do it. Even the good old "develop" dyes were not without their cares, however, for many of you had trouble in the diazotizing and subsequent development — especially in the summer season when the water temperatures were the highest. Some of you even went to the cumbersome method of putting ice in the bath. Others found that sulfuric acid reacted with the metal of their tubs giving light spots. Two practices are used to eliminate this, one is to bag all the goods, and another to change from 5 per cent sulfuric to 2 or 3 per cent muriatic (nitrite the same).

With the necessity of changing the dyeing of the black came varying types of couplings, developments, and aftertreatments, as well as a demand for faster to washing direct blacks. In varying degrees you succeeded in getting your sample approved and, in general, I believe this work is progressing very well. My personal opinion is that the best thing is to dye with the higher priced aftertreated blacks. Although it is more expensive, you have less trouble and the satisfaction of turning out a superior dyeing.

In the 50/50 yarn we have two chances for difference, that is, the cotton and also the wool. Since the cotton is generally the same, the chief difference will be found in the wool. The manufacturers' supply of wool is varied, and it is an established fact that wool from different species of sheep and from different climates, dye considerably different. Usually an effort is made to give you a uniform blend, but even with precautions, occasionally we find some wool taking up more dye or stain, as the case may be, than others. Consequently, we notice a decided shading from hose to hose in the same batch; however, the chief cause for shading I have found to be overloading of the tub, especially on rotary type machines in general use. I believe when the size load such as a 200 lb. machine was used as it's named, they meant just that, and whenever you load your tubs beyond their rightful capacity you're heading for trouble. Yes, I am fully aware of the lack of facilities to take care of your production, and in your place, I expect I would do just as you are doing, getting every possible dozen from the machine.

The scouring operation, usually neglected in the dyeing of the woolies, will aid you in getting more uniform shades, for by scouring the oils from the wool, you get a much more uniform base on which to build the shade. Soda and soap is a cheap and effective scour. Ammonia may be used and since it volatilizes at higher temperatures, the pH of the bath wlll drop to a workable dyeing level, maintaining the one-bath method now in general use. However, this is by no means advisable as the best union results are obtained in a neutral bath throughout the dyeing operation.

With the passing of the random chrome dyed wool there is a vogue for union dyeings, which are generally superior in fastness, gives more consistent results, and yields a much nicer finished hose. In some cases directs, which stain the wool heavily, are used, but generally found best is including neutral dyeing wool colors in the formula. No extra treatment is required to give the goods a union dye over the white wool, and the cost is about the same. If you have not yet tried this, I believe it would be worth while to investigate it further.

Also with the passing of the random comes the desire for a tint in order to identify the yarn and the knitted hose. I pass on to you an idea that possibly is new to most of you, but it will need be worked out with the yarn

manufacturers, unless you prefer to spot your cones. Recently while working on the 50/50, this tint problem came up, and we sprayed on the wool at the picker a solution of one of the directs used in the formula. This serves the purpose well, for in the dye bath the direct washes off the wool and is salted on the cotton. If you have a need for the fugutive tint, I will be glad to work out the details with you.

As for the dyeing procedures, I believe in simplifying wherever possible, but the method you use should depend on the properties of the dyes you are using. Generally, the maximum temperature of about 200° is maintained, and the bath flushed in order to cool the bath slowly, a practice which prevents felting of the wool.

I believe these remarks will serve as an opening for our discussion. Just one more thing I wish to say, that is, the American soldier is the best dressed man on the face of the earth; our job, our challenge, is to keep him so. Our slogan may well be, "If he is willing to die for our freedom, let us freely dye our best for him."

MEMBERSHIP APPLICATIONS

Corporate

Hanes Dye & Finishing Co., Winston-Salem, N. C.

Senior

John J. Campanini—Supt. of Dyeing and Finishing, Newport Finishing Corp., Fall River, Mass. Sponsors: Philip Strengs, J. H. Gormley, Jr.

Edward J. Capuano—General Manager and Treasurer, Newport Finishing Corp., Fall River, Mass. Sponsors: Philip Strengs, J. H. Gormley, Jr.

George L. Caron—Dyer, Threads Inc., Gastonia, N. C. Sponsors: G. R. Howard, A. S. Cooley.

Charles J. Carroll—Salesman, American Dyewood Co., Philadelphia, Pa. Sponsors: A. W. Etchells, B. C. Bond.

Francis L. Fennell—Peroxide Bleaching Demonstrator, E. I. duPont de Nemours & Co., Inc., Boston, Mass. Sponsors: L. D. Fleming, P. J. Ariente.

John G. Ferguson—Boss Dyer, Newport Finishing Corp., Fall River, Mass. Sponsors: Philip Strengs, J. H. Gormley, Jr.

George S. Garvin—Chemist and Colorist, Bound Brook Textile Dye & Print Works, Bound Brook, N. J. Sponsors: E. A. Lutz, F. Gonnerman.

Stanford L. Hermann—Research Chemist and Purchasing Agent, Apex Chemical Co., Inc., Elizabeth, N. J. Sponsors: H. N. Craig, J. E. Galarde.

William Albert Hickman—Manager, Southern Textile Chemical Corp., Clearwater, S. C. Sponsors: A. N. Henschel, P. J. Wood.

V. B. Holland—Chief Chemist, Cannon Mills Co., Kannapolis, N. C. Sponsors: C. N. Rabold, T. R. Smith.

William H. Jones—Asst. Supt., Clearwater Manufacturing Co., Clearwater, S. C. Sponsors: Joseph Houth, A. N. Henschel.

Albert Leitstein—Salesman, L. Sonneborn Sons, Inc., New York, N. Y. Sponsors: A. Moscowitz, Joseph Colman.

Robert O'Hara—Sales Agent, Joseph Bancroft & Sons Co., New York, N. Y. Sponsors: T. F. O'Brien, P. J. Kennedy.

Henry B. Walker—Director of Textile Laboratories, Rohm & Haas Co., Inc., Philadelphia, Pa. Sponsors: S. N. Glarum, J. W. Stallings

SPECIAL NOTICE TO AUTHORS OF PAPERS PRESENTED BEFORE GENERAL MEETINGS OF THE A.A.T.C.C. OR ANY OF ITS LOCAL SECTIONS

The following notice is being sent to chairmen and secretaries of local sections, with the request that they present a copy to everyone who is to deliver a paper before his section, as early as possible before the paper is to be presented.

Secretaries of local sections are earnestly requested to prepare condensed reports of sectional meetings which may be promptly distributed to the press for publication. This of course does not refer to the longer and final reports which should be forwarded to the Secretary of the Association.

THE A.A.T.C.C., like most of the other technical and scientific societies, has an established rule that no paper presented at any of its meetings, either local or national, may be published elsewhere until it has appeared in the Proceedings of this Association. While this rule may at times appear somewhat arbitrary, it has several advantages. In the first place, every paper is carefully corrected and approved by the author before it is published in the Proceedings, thus assuring the elimination of any errors or misstatements which might have crept in unintentionally. In the second place, any discussion following the delivery of the paper can be published in the same issue with the paper itself. In special cases authorization may be given for publication simultaneously, but not previously, in other journals. In such instances corrected galley proofs will be furnished for the convenience of such other publications if they wish to take advantage of this offer.

Since there is necessarily delay in publication of the entire paper after its presentation, an abstract of each paper should be prepared by the author himself, and made available at the time of its presentation, as there are a number of newspapers and trade journals which would be glad to obtain such an abstract for immediate publication. Whenever abstracts are available, our Publicity Committee will be glad to see that they are properly distributed.

OBITUARY

WILLIAM WALTER HALES

WILLIAM WALTER HALES, salesman for the Sandoz Chemical Works, Inc., died in his sleep on June 23rd. He was 45 years of age.

Mr. Hales had formerly been with Read Holliday in Australia and later with the Schoelkopf Company, predecessor to National Aniline Division, Allied Chemical and Dye Corp. He has been with Sandoz since 1922 as a salesman contacting the jobber trade in New York City and the Metropolitan area. He was a member of the New York Section of the American Association of Textile Chemists and Colorists.

Funeral services were held on Sunday, June 27th, at the Frank Campbell Funeral Church.

• CELANESE PATENTS

Celanese Corporation of America recently was granted two United States Letters Patent relating to the production of illuminated discharge effects on dyed textile materials.

According to the process of the first patent, illuminated discharge effects on azo dyed textile material are obtained by locally applying a discharge paste comprising a vat dyestuff, a reducing agent and a salt of an acid of phosphorous having a basic reaction to a dyed textile material.

The treated material is then subjected to ageing, whereby the azo dye is decomposed, the decomposition products removed and the material subjected to oxidation to illuminate the portions of the material printed with the vat dye.

According to the process of the second patent, the illuminated discharge effects are obtained on azo dyed textile material by applying a discharge composition comprising a vat dye, a reducing agent and a salt of a weak acid of boron, silicon or sulfur which has a basic reaction in aqueous solution. The treated material is then subjected to the usual ageing, washing and oxidation.

The patterns obtained on textile materials, particularly cellulose derivative textile material, by the above processes are said to be clean, sharp, bright and unmottled. Moreover, the printing pastes are said to have excellent color value and the objectionable halo about the edges of the discharge pattern is eliminated.

• APPOINTED SALES MANAGER

George O'Keeffe has been appointed Sales Manager of the Dryer Division of Proctor & Schwartz, Inc., builders of industrial drying and textile machinery, Seventh Street and Tabor Road, Philadelphia, Pa. Mr. O'Keeffe, who is a graduate of the Stevens Institute of Technology, was formerly a member of the Sales Department of Proctor & Schwartz. He will handle all matters pertaining to Sales which were formerly taken care of by the late Frederick Kershaw, president of the company.

• DEVELOPS SOAP EXTENDER

Of timely interest to the textile industry is the development of a soap extender by Burkart-Schier Chemical Company of Chattanooga, Tennessee. The cost of this new product—Burk-Schier PWT—is less than that of soap, yet it is claimed that it may be substituted pound for pound for a considerable percentage of soap customarily used. It is stated that woolen and worsted mills report that superior results are obtainable with PWT at an actual savings by replacing 3 ounces of soap in the fulling and scouring formula with 3 ounces of Burk-Schier PWT, retaining the usual amount of Soda Ash. It is further stated that the soap stock has added detergency and is kept fluid. The problem of starting up with gelled or solid soap stock is eliminated.

With the above formula wetting is said to be faster, and dirt, soil and grease to be readily removed and held in suspension for quick rinsing.

For scouring rayons and cottons PWT may be applied successfully to yarns, hosiery and piece goods. Burk-Schier PWT and mild alkali are said to insure clean, well bottomed goods—ready for bleaching or for dyeing. It is claimed that PWT has excellent wetting properties, and when used in the dye bath in place of soap, insures even penetration of dyestuff and clear bright colors in a minimum of time.

The manufacturers state that Burk-Schier PWT is a versatile textile auxiliary and of special interest now in view of the shortage of soaps and other wet processing agents. PWT is available in quantity and immediate deliveries can be made. Samples and further data upon request.

• AMALGAMATED EXPANSION PROGRAM

The completion of an expansion program marked by the occupation of a larger plant for increased service to the Textile Industry has been announced by Amalgamated Chemical Corporation, Philadelphia.

In moving to the new location at Rorer and Ontario Streets, Philadelphia, the Company has taken over the former No. 2 plant of the Ontario Dyeing Company. Remodeling of the building has been carried out over a period of several months. There is a total of 56,000 square feet of floor space. The increased plant space will be used to step up the production of chemicals for use on military fabrics, according to Harold B. Dohner, president of the firm. It is stated that about 75 per cent of their production is now going to the war effort. A new research and production laboratory with the latest testing equipment has been installed. Office suites have been completely redecorated. The Company was formerly located at Auburn Street and Trenton Avenue.

Harold B. Dohner
President of Amalgamated

The company states that one of their most important contributions to the war effort has been the development of a non-toxic water repellent and mildew-proof finish, known as Fen-Aseptic. This product, it is said, has been approved by the Army Quartermaster Corps for use on a wide variety of fabrics, including jungle hammocks, ducks and twills for shelter tents, barracks bags, uniform twill, cotton cloth, cotton sleeping bags, duck netting and mosquito bars. Because Fen-Aseptic is a one-bath treatment, it speeds the production of war-vital textiles. It is claimed that, because of its non-toxicity, it is completely safe for soldiers even under the rigid requirements of jungle warfare.

The Company is also making Fen Water Repellent and Fen Anti-Mildew. The former is said to meet government specifications for fabrics that require water repellency alone, such as uniform twill, herringbone twill, cotton duck for case covers, canvas for leggings. Fen Anti-Mildew is used on fabrics such as camouflage cloth, sandbagging, cordage and thread, burlap and osnaburg.

Amalgamated Chemical Corporation was established in 1939. Harold B. Dohner, president, is a member of the Processing

Oils Association, the American Association of Textile Chemists and Colorists and the Chemical Club of Philadelphia.

Robert A. Bruce is vice-president and treasurer of the Company. John M. Jester is secretary.

Mr. Bruce represents the Company in the South with headquarters in Greensboro, N. C. C. H. Crane is the representative in Eastern Pennsylvania, New York and New England. G. C. Harkins is the representative in Southern Pennsylvania, Delaware, Virginia and Maryland.

• JOIN AMERICAN VISCOSE

The American Viscose Corporation announces that Paul C. Beatty, formerly a member of the faculty of the Philadelphia Textile Institute, and Albert R. Martin, previously with the Textile Foundation, New York, have joined the staff of the company's Sales Development Department. This Department is engaged in research and experimental work to improve rayon and rayon products, to perfect manufacturing processes, and to develop new uses for rayon.

Mr. Beatty, a graduate of the Philadelphia Textile Institute, will assist Robert A. Smith, head of the Woolen Division of the Textile Unit. While a member of the faculty of the Philadelphia Textile Institute, he taught weave formation and fabrics analysis. Prior to his connection with the Institute, Mr. Beatty was associated with Peerless Woolen Mill where he obtained his earlier practical training, and with Beacon Manufacturing Company where he was in an executive capacity.

Mr. Martin, who has been associated with the Textile Foundation since 1939, will assist Howard E. Shearer, in charge of the Industrial Division of the Sales Development Department. He is a graduate of George Washington University with a Bachelor of Science degree in chemistry, and has done graduate work at the same university for the past three years. Previously he was with Gossett Mills for a number of years where he obtained practical experience in many phases of textile processing. At the Textile Foundation, Mr. Martin worked as research chemist in the field of cellulose chemistry and for the past year was in charge of the department for disseminating technical information to the textile industries.

• NAMED CHEMICAL EXECUTIVE

Wilmington Chemical Corporation, 10 East 40th Street, New York, N. Y., announces that Edmond du Pont, son of the late Francis I. du Pont, has been named vice president, in charge of plant operations. Mr. du Pont, who will make his headquarters in Wilmington, Delaware, will direct all of the firm's manufacturing activities, which recently have been expanded to provide for the large-scale production of Naftolen, a chemical used extensively in the production of synthetic rubber goods.

Other officers of the firm are Herbert Waller, president; Hubert I. du Pont and Edward V. Osberg, vice presidents; and M. A. Solmssen, treasurer. The company's enlarged laboratory, which includes research and development facilities for the investigation of rubber and plastics, is under the direction of Dr. F. S. Rostler, chief chemist.

• SALE OF ENEMY PROPERTIES

Alien Property Custodian Leo T. Crowley recently issued an order prescribing conditions under which enemy properties held by his office ultimately will be offered for sale.

General Order 26 provides three means of sale for vested business properties:

Properties valued at less than $10,000 ordinarily may be sold at either public or private sale; larger business properties will be disposed of through public sales, ordinarily through the method of sealed, competitive bids; some properties will be disposed of in government-regulated securities markets.

The order anticipates that many properties will be sold to other departments or agencies of the United States Government, or at their request, under regulations fully protecting the interests of the United States.

Real Estate will be disposed of through recognized brokers, while perishable or expendable commodites will be sold privately at prevailing market prices.

Mr. Crowley emphasized that no properties yet are up for sale. Each public sale will be advertised at least 15 days in advance in a newspaper of general circulation in the place where the property is located and in trade papers and other appropriate publications.

The intent of the regulation prescribed under the order is four-fold:

To protect the public interest, to further the war effort, to protect the interests of the United States and of purchasers, and to obtain maximum prices for the properties offered for sale.

• GOVERNMENT SEEKS BUSINESS AND INDUSTRY ANALYSTS

More and more critical positions in the Government service are being vacated by men drawn into the armed services. Qualified persons must be recruited to replace these men. There is a particular need now for persons who have had executive experience in business or industry to do work in connection with the extension of the rationing program in various commodity fields.

Persons are desired who have had executive experience (involving analysis) in business or industry as distributors or manufacturers of such commodities as foods, textiles, metals, consumer goods, or industrial equipment. Specialization may have been in sales management, factory management, procurement, market analysis, traffic management, or expediting of production.

Men are needed to make analyses with regard to distribution and production; to analyze the needs for and the supply of critical materials, consumer goods, and industrial commodities; to survey the availability of productive capacity, materials, or commodities, and the possibilities of substitution; to work out, after consulting with government agencies and business organizations, balances between requirements and supply.

The positions pay from $2,433 to $7,128; however, few appointments will be made to positions paying $5,228 and over. There are no age limits for this examination and no written tests. Persons now using their highest skills in war work should not apply. Appointments in Federal positions are made in accordance with War Manpower Commission policies and employment stabilization plans.

Persons who have filed with the Commission's Washington office since October 1, 1942, applications for other positions, or supplementary statements in connection with some previous application need not file again. Such persons will be considered for these positions on the basis of their records now on file.

Further information and application forms may be obtained at first- and second-class post offices, Civil Service Regional Offices, and the Commission in Washington, D. C.

• A.S.A. STANDARD LIST

The American Standards Association has announced publication of its new list of American Standards which will serve as a useful reference piece to the engineering and purchasing departments of manufacturing firms.

More than 600 standards are listed, 94 of which represent new and revised standards approved since the last (August 1942) issue. These are marked with an asterisk.

Standards are listed by subject and cover civil, mechanical, electrical, mining, chemical and other engineering fields as well as metals and materials, specifications of interest to the textile, wood, pulp and paper industry, methods of test for the finished product, dimensions, etc. They reach into every important engineering field and serve as a basis for many municipal, state and Federal regulations. By frequent review these standards are kept abreast of new developments in the fields to which they relate. Recently, the ASA has entered the field of consumer goods, working on sizes for children's garments, household refrigerators, gas appliances, sheets and sheeting, bedding and upholstery, fastness of colored textiles, photographic

standards, civilian radio, etc. It is also developing standards for women's work clothes as a special war project.

Standards have assumed a vital role today in connection with the war effort. Every government order is based on specifications, and standards are further used in industry in simplifying the production problem, conserving materials, pegging quality to price control, in inspection, contracting and subcontracting.

A special section of the List is devoted to American War Standards—standards developed specifically for war production needs. These wartime jobs have been requested by the Army, Navy, WPB, OPA, and industry. In fact, the ASA is now under contract with the Federal Government to carry on such work.

Another special section is devoted to American Safety Standards—also of great importance to all-out war production in connection with the President's program for the conservation of manpower as well as the reduction of absenteeism in war plants, when such absenteeism results from accidents.

Four pages of the pamphlet are devoted to an alphabetical listing of standards for easy reference.

In each case, the standards approved by the ASA represent general agreement on the part of maker, seller, and user groups as to the best current industrial practice. More than 500 national organizations are at present taking part in this work.

This list of American Standards for 1943 will be sent free of charge to anyone writing in for it. Requests should be addressed to the American Standards Association, 29 West 39th Street, New York.

• 1943 HOSIERY COLORS

In accordance with its wartime conservation policy, The Textile Color Card Association again features only three colors in its 1943 Fall Hosiery Collection, just released to members in the Confidential Advance Edition. The association has named these new tones Rica Sun, Rio Tan and Mexibeige.

It was stressed by Margaret Hayden Rorke, managing director, that despite the limitation in the number of colors, particular attention has been given to creating distinctive new tones having warmth and vitality, but which in no way disturb the conservation of dyestuffs or conflict with any dyeing restrictions.

Each color in this hosiery collection has been chosen for its fashion and merchandising importance and has been keyed closely to the Colors for Shoe Leathers, as specified in the War Production Board Conservation Order M-217, as Amended April 9, 1943, which restricts the shoe colors to Town Brown, Army Russet, Black and White. Because the hosiery tones are limited in number, Mrs. Rorke further pointed out, special care was given to the harmonizing or contrasting attributes of each shade with a wide and varied range of the leading costume colors for fall. All of the three colors are adaptable to rayon, as well as cotton and wool hosiery, and can be included among the maximum number of colors in accordance with the War Production Board Hosiery Order L-274.

• JOINS McCANN-ERICKSON

Hugh D. Lavery has joined the New York office of McCann-Erickson, Inc. For the past seven year he has been with E. I. du Pont de Nemours & Co., as advertising manager of a number of departments and subsidiary companies, and later as merchandise manager of the Organic Chemicals Department.

At du Pont he handled the initial marketing for "Five Star Anti-Freeze" and planned both the merchandizing of du Pont "Zelan" water repellent finish for textiles, and the marketing of du Pont "Aridex" water repellent for dry cleaning and laundry fields. He was at one time associated with J. Walter Thompson and Ruthrauff & Ryan.

• APPOINTED FINISHER LICENSEES

Davis Screen Plant of Fall River, Mass., Dodgeville Finishing Co. of Attleboro, Mass., and Artex Dyeing & Finishing Co. of Paterson, N. J., have been appointed finisher licensees under the American Viscose Corporation's "Crown" Tested Plan, being fully qualified to dye and finish rayon fabrics in accordance with the standards established under the "Crown" Tested Plan, it was announced recently.

• NEW BOOK BY BROOKS EQUIPMENT

A new book covering problems of Remote Controls, Universal Joints, Shaft Joints, Shaft Couplings, Shaft Hangers, Shaft Assemblies, Hinged Joints, Universal Joint Covers, Shaft Expansion Couplings, Operating Gears, Engine Controls, Steering Controls, Valve Controls, Ventilation Controls (manual), has been just released by the Brooks Equipment Corporation, 90 West Street, New York City, N. Y., and the Brooks Equipment Corporation of California, with offices at San Francisco, California; Seattle, Washington; Los Angeles, California; and Portland, Oregon.

This book provides complete descriptions of two entirely new joints; the Consolidated Hinged Joint with positive and effective operating range at angles from 0° to 92° in any one given plane; and the Brooks Universal Joint with positive and effective operating range at angles from 0° to 360° in any plane.

Along with the descriptions are data sheets and blueprints of the joints themselves and the brackets, expansion couplings, assemblies, shaft hangers, accessories used for their installations.

The joints described are said to open up limitless possibilities for design. Shafts can now be made to rotate at any angle—on any plane in any direction. The Brooks Universal Joint can be connected to extension shafts which rotate and oscillate simultaneously and have other movements.

A registered copy of this book will be sent free to any reader interested in the subjects it covers.

• JOINS INTERCHEMICAL

E. T. Fritzsching has resigned as Vice President and General Manager of Rare Chemicals, Incorporated. He was one of the original organizers of this company. He has joined Interchemical Corporation in connection with the development and promotion of new products in the fine chemicals field.

E. T. Fritzsching

Interchemical Corporation's present products are largely in the field of chemical coatings and related materials. In addition to its various operating divisions, its subsidiaries include Ault & Wiborg Corporation, industrial finishes; Aridye Corporation, textile coloring materials; R-B-H Dispersions, Incorporated, specialized pigment dispersions; and Virginia Chemical Corporation, titanium dioxide.

• WAR TRAINING COURSES

The Division of Industrial Extension of Rhode Island State College announces that a number of short—intensive, tuition-free, war training courses in engineering, science and management are being offered. These evening courses will be organized and conducted in various cities and towns in

Rhode Island and southeastern Massachusetts. Cooperating schools are the Bradford-Durfee Textile School in Fall River, Mass., and the New Bedford Textile School in New Bedford, Mass. The courses are designed to provide educational training for men and women now working in war industries and who have abilities which can be used in more responsible posts; for men and women who are now working in war industries and who can be made more serviceable by undertaking other types of work than they now perform; for men and women who are not yet employed, but who plan to enter war industries as production workers, either in some special capacity or on the supervisory level. Courses are being offered in the following subjects: mechanical drawing, machine design, industrial electronics, applied metallurgy, plastics engineering, welding supervision, strength of materials, naval architecture, pre-engineering mathematics, engineering mathematics, inorganic chemistry, analytical laboratory technique, advanced organic chemistry, chemistry of textile fabrics, cost accounting, advanced cost accounting, advanced accounting, production control, inventory control, industrial safety engineering, personal supervision and human relations, motion and time study, and office management.

A booklet describing these courses, entrance requirements, etc., may be obtained from the division of Industrial Extension, Rhode Island State College, Kingston, R. I., or R. I. College of Education Building, Providence, R. I.

• JOINS HART PRODUCTS

Hart Products Corporation, New York City, have added to their technical staff, H. Martin Friedman, B. Sc., M. Sc., as chief chemist in charge of their leather chemicals division. Mr. Friedman, who received his Master's Degree in Chemistry from the Graduate School of New York University, was formerly with A. J. & J. O. Pilar, Newark, N. J., producers of chemical specialties for the leather trade, as head of their chemical laboratory.

• MEETING, DYESTUFF ADVISORY COMMITTEE

Further conversion of equipment to meet new military requirements of the Quartermaster's Corp and Chemical Warfare Service is being planned by the dyestuff industry, it was revealed on June 3rd at the meeting of the members of the Dyestuff Manufacturer's Industry Advisory Committee and government officials.

The recent adoption of dark olive drab for Army uniforms and the Navy's new battleship grey present production problems to the industry necessitating this proposed stepping up of the conversion program, it was stated. The plan, which is a voluntary one, is already in process in part of the industry.

Order M-103 as recently amended (Dyestuffs and Organic Pigments) was reviewed by the committee, which agreed that the order as it now stands is practicable.

It was also recommended that dye and pigment colors exempt from Order M-103 be listed for clarification and that the word "retailer" as now used in the order be more clearly interpreted.

Dr. Arnold L. Lippert, chief of the Dyestuffs Section, Textile, Clothing and Leather Division, presided.

• NEW ATCO HEADQUARTERS

A recent announcement made by Joseph Buonanno and Hugh J. Bonino, co-owners of the Atlantic Chemical Co., disclosed that purchase has been made of the Centredale Mill in North Providence, Rhode Island. The new home of ATCO Products is a well-known industrial landmark of the North Providence area.

The purchase included 70,000 sq. feet of floor space, of which 50,000 sq. feet will be put into immediate operation for the manufacture of ATCO Textile Chemicals. At present the Atlantic Chemical Co. is engaged 80% in turning out Textile Chemicals for the war effort, according to a recent statement made by Joseph Buonanno.

Both co-owners were top-ranking college athletes. Mr. Buonanno was a crack grid star at Brown University a decade or so ago, while Mr. Bonino is an outstanding pigskin alumnus of Washington & Lee. Both played two seasons of professional football with the Providence Steamrollers.

• NEW TYPE DRUM DRYER

Dyeing technicians of the American Viscose Corporation's Textile Unit, working in cooperation with the engineering staff of Proctor and Schwartz, drying machinery manufacturers, of Philadelphia, Pa., have developed a new type of drum dryer for use in drying and finishing warp knit and circular knit fabrics. The new machine uses a principle different from that currently in common use in the United States. It not only is said to give improved results on fabric stability or in producing fabrics that are more resistant to shrinkage and stretch but is also said to reduce the cost of drying and finishing warp knit and circular knit textile fabrics.

The principle used in the new machine involves the drawing of hot air directly through the knit fabric instead of having the air glance off the surface of the fabric. At the same time, by the use of an overfeeding device, longitudinal fabric stretch is controlled; and by means of a spreading mechanism and a fabric blanket lateral fabric stretch is controlled.

One of the new machines has been built by Proctor and Schwartz and is now in commercial use in a textile mill, but the shortage of needed critical material will probably delay manufacture of additional machines until after the war.

• ADVISORY COMMITTEE MEETING

The critical situation regarding edible oils, particularly soya and castor, was emphasized at the Pyroxylin and Vinyl Resin Coated and Fabric Industry Advisory Committee Meeting in Washington. The members were asked to approximate the amount of essential civilian oil which will be needed for the balance of 1943, naming the end-uses considered by them to be essential. This information is being sought by the War Production Board from the entire industry.

The committee members were told that nitrocellulose is now free for use as it is no longer under allocation.

Plasticizers are extremely critical and substitutes were suggested for those which are not available. The members were asked to test some of the substitutes and report on the results obtained. Samples of some of the substitute plasticizers may be obtained by writing to the Plasticizers and Glycols Unit, Chemicals Division of WPB.

The solvents situation was discussed and it was stated that Methyl Ethyl Ketone, Ethyl Acetate, Isopropyl Acetate and Butyl Acetate are all critical; acetone, however, is free at the present time.

Previous to the next meeting of the committee, tentatively set for June 17, the information requested on oils and end-uses will be correlated and discussed with the Fats and Oils Branch, and the results presented to the committee.

• PATENT ON FELT-LIKE MATERIALS

Celanese Corporation of America recently was granted a patent relating to the production of fibrous felt-like materials.

According to United States Letters Patent No. 2,321,108, issued on application of George Schneider, non-thermoplastic fibers—such as cotton—which have no felting properties are mixed with curled or crinkled fibers of thermoplastic derivatives of cellulose—such as cellulose acetate—containing a plasticizer therefor, and the mixture subjected to the action of heat and pressure.

The thermoplastic fibers are softened by this treatment and serve to hold the non-thermoplastic fibers together, forming a fleece-like web.

GOVERNMENT LINING FABRICS

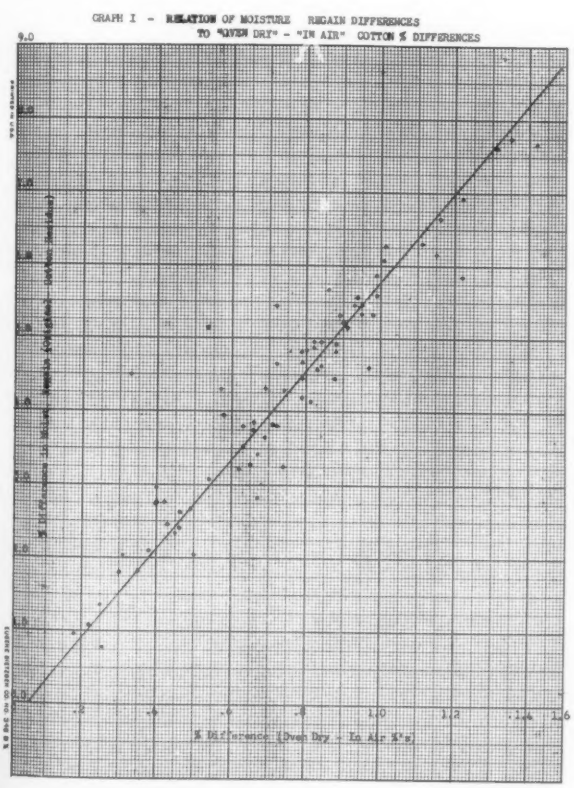
(Continued from page 302)

the moisture regain. The relationship should be that of a nearly straight line.

The data shown in chart I, gave a good straight line. Of the 79 points plotted, only 4 deviated by more than a small amount from the best straight line drawn through the points. To use this graph, find the difference between the original and residue moisture regains on the vertical coordinate. Then move horizontally to the right, intersect the straight line through the data and move vertically downward to the horizontal coordinate where the difference between the "oven dry" and "in air" cotton per cents is obtained. This difference added to the "in air" result of the caustic boilout is the "oven dry" value. Reference to chart II under the M.R. Calc., column (No. 3) shows an excellent agreement of these values with the experimental "oven dry" cotton per cents (column 2).

Although graph I is an excellent means for arriving at the "oven dry" per cent, it is not practical as the moisture regain values must be determined by oven drying the samples tested. This is the time consuming step we wished to eliminate. However, we have established conclusively that a consistent and relatively simple relationship exists between the variables used in graph I. The literature [5, 6] shows that moisture regain and relative humidity are related in a nearly straight line trend (definitely so on cotton) in the range of relative humidities we experienced (15-70 per cent). The effect of normal temperature variations such as we experience in our laboratory (range 66-82° F.) is negligible[5, 6]. Knowing these relationships we could predict closely the differences between the "oven dry" and "in air" cotton per cents by using the relative humidity data.

Graph II shows the correlation between the relative humidity difference, RH, at the time of the original "in air" weighings, RH at the time of the residue "in air" weighings, and the difference between the "bone dry" and "in air" cotton per cents as found experimentally. The data for the location of the various points in graph II are found in chart I. These data are more scattered and inconsistent with a straight line than was the case in graph I; however, there is a definite straight line trend. The variations from the straight line drawn as best representing the trend occur because of the indirectness of the correlation; the variable factors such as hysteresis effect, temperature variations, previous stock history, stock aggregation and variations from the 20 per cent cotton maximum. These factors are



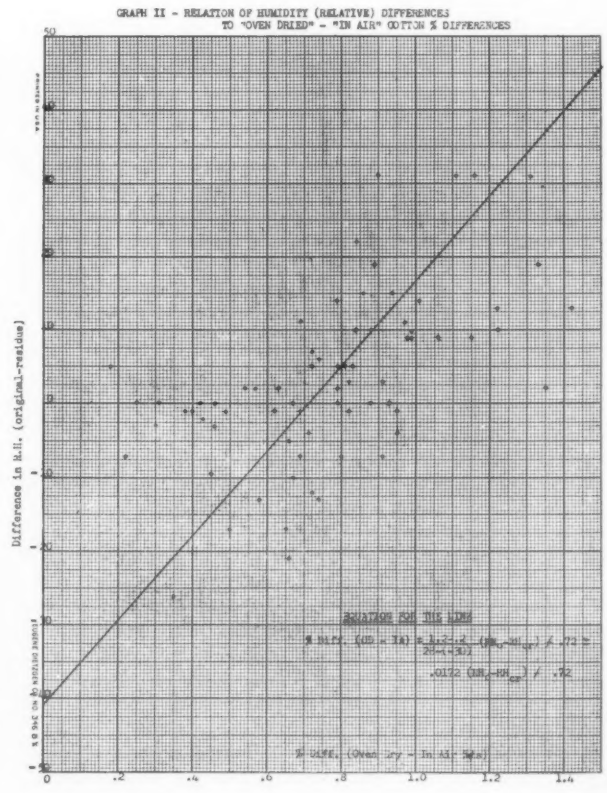

GRAPH II - RELATION OF HUMIDITY (RELATIVE) DIFFERENCES
TO "OVEN DRIED" - "IN AIR" COTTON % DIFFERENCES
Difference in R.H. (original-residue)

CHART No. I

Moisture Regains and Relative Humidity Data on Original and Cotton Residue Samples

O.D.—"Oven Dried." I.A.—"In Air." C.R.—Cotton Res. O—Original.

	Original			*Cotton Residue*					*Experimental*		
	1	2	3	4	5	6	(1-4)	(3-6)	7	8	(8-7)
BLENDS	*Moist. Regain*	*Temp. °F.*	*R.H. %*	*Moist. Regain*	*Temp. °F.*	*R.H. %*	*% Diff. (O-CR) Moist. Regain*	*R.H. Diff. (O-CR)*	*"In Air" Cotton %*	*"Oven Dry" Cotton %*	*O.D.-I.A. % Diff.*
1	12.10	73	70	7.21	73	70	4.89	+ 3	20.83	21.65	.82
2	5.00	72	22	2.54	74	24	2.46	— 2	18.15	18.58	.43
3	5.97	79	28	3.93	79	45	2.04	—17	20.17	20.67	.50
4	6.53	75	32	2.69	73	36	3.84	— 4	19.03	19.74	.71
5	6.98	71	37	2.67	78	38	4.31	— 1	16.33	17.02	.69
6	6.94	77	39	3.85	76	37	3.09	+ 2	18.23	18.77	.54
7	7.08	73	20	2.63	73	20	4.45	0	18.50	19.38	.88
8	8.97	73	46	3.30	72	31	5.67	+15	14.08	14.94	.86
9	9.62	71	44	2.68	72	31	6.94	+13	18.20	19.42	1.22
10	6.25	69	40	1.30	75	18	4.95	+22	17.58	18.42	.84
11	6.61	73	23	1.66	74	24	4.95	— 1	17.18	18.00	.82
CARD ROVINGS											
1	12.10	75	60	3.26	74	41	8.84	+19	15.05	16.38	1.33
2	8.73	74	24	2.58	73	31	5.15	— 7	15.95	16.86	.91
3	7.05	79	28	3.76	79	45	3.29	—17	17.95	18.60	.65
4	7.13	77	33	5.32	75	59	1.81	—26	16.85	17.20	.35
5	5.94	77	26	2.50	73	36	3.44	—10	19.89	20.56	.67
6	7.02	73	36	2.42	76	25	4.60	+11	22.28	23.25	.97
7	6.60	75	42	4.19	79	45	2.41	— 3	18.62	19.08	.46
8	7.89	76	37	5.30	73	26	2.59	+11	18.10	18.89	.79
9	6.78	77	39	3.25	76	37	3.53	+ 2	19.08	19.71	.63
10	9.46	77	37	1.71	71	35	7.75	+ 2	17.85	19.20	1.35
11	8.08	72	30	2.02	75	21	6.06	+ 9	17.68	18.74	1.06
12	5.02	78	26	3.22	77	29	1.80	— 3	16.88	17.18	.30
13	8.32	71	25	2.83	77	29	5.49	— 4	18.20	19.15	.95
14	6.81	73	26	4.06	75	26	2.75	0	16.00	16.42	.42
15	10.00	71	44	2.32	72	31	7.69	+13	19.68	21.10	1.42
16	4.82	73	21	2.20	74	21	2.62	0	18.63	19.09	.46
17	3.79	73	30	2.83	72	25	0.96	+ 5	20.00	20.18	.18
18	4.47	66	21	1.72	76	22	2.75	— 1	14.78	15.18	.40
19	4.46	66	21	2.36	76	22	2.10	— 1	18.45	18.85	.38
20	5.12	66	21	2.44	76	22	2.68	— 1	18.90	19.39	.49
21	8.82	76	59	3.60	74	28	5.22	+31	17.30	18.20	.90
YARNS											
1	8.82	70	55	4.57	75	49	3.25	+ 6	18.30	19.04	.74
2	6.62	77	39	2.86	76	37	3.76	+ 2	17.10	17.73	.63
3	3.50	76	24	2.42	72	31	1.08	— 7	16.85	17.07	.22
4	4.12	73	21	2.77	74	21	1.35	0	19.45	19.70	.25
5	8.43	71	33	4.58	69	38	3.85	— 5	18.46	19.12	.66
6	5.92	73	21	3.10	74	21	2.82	0	17.45	18.12	.67
7	4.54	73	21	2.52	74	21	2.02	0	16.28	16.59	.31
8	5.19	66	21	2.23	76	22	2.96	— 1	17.19	17.59	.40
9	6.30	76	22	3.07	73	23	3.23	— 1	16.80	17.42	.62
10	7.07	74	24	1.75	70	25	5.32	— 1	18.20	19.15	.95
11	6.74	74	24	1.82	70	24	4.92	0	17.50	18.38	.88
12	6.30	74	24	1.81	70	24	4.49	0	17.63	18.42	.79
13	7.75	71	31	2.15	82	22	5.60	+ 9	17.59	18.58	.99
14	7.10	74	15	2.81	81	28	4.29	—13	17.40	18.14	.74
CLOTH											
1	9.94	76	56	4.38	76	41	5.56	+15	18.28	19.22	.94
2	9.94	79	50	3.53	76	41	6.41	+ 9	18.04	19.19	1.15
3	9.54	79	50	4.21	76	41	5.33	+ 9	19.03	20.05	.98
4	9.80	79	50	3.94	76	41	5.86	+ 9	17.80	18.79	.99
5	11.37	76	60	6.24	76	67	5.13	— 7	18.06	18.97	.91
6	8.96	74	32	4.28	76	60	4.68	+14	17.79	18.58	.79
7	9.20	75	60	3.89	74	41	5.31	+19	17.45	18.35	.89
8	7.72	74	24	2.89	73	31	4.83	— 7	16.86	17.66	.80
9	5.43	74	24	3.08	73	31	2.35	— 7	19.22	19.67	.45
10	7.95	67	28	2.47	74	28	5.48	0	17.16	18.09	.93
11	7.63	75	32	2.18	76	25	5.45	+ 7	15.72	16.44	.72
12	8.19	68	36	2.32	73	26	5.85	+10	17.99	19.21	1.22
13	7.38	68	36	2.77	73	26	4.61	+10	18.80	19.64	.84
14	7.48	68	36	2.61	73	26	4.87	+10	18.90	19.78	.88
15	6.95	76	24	3.30	72	31	3.65	— 7	19.23	19.92	.69
16	6.53	66	21	2.34	68	16	4.19	+ 5	18.80	19.59	.79
17	6.80	66	21	2.22	68	16	4.58	+ 5	19.22	20.05	.83
18	6.44	66	21	1.79	68	16	4.65	+ 5	17.05	17.77	.72
19	6.88	66	21	2.74	68	16	4.14	+ 5	18.43	19.24	.81
20	7.00	66	21	2.19	68	16	4.81	+ 5	17.50	18.29	.79
21	7.13	78	21	3.38	72	42	3.75	—21	18.69	19.35	.66
22	10.37	76	59	2.76	74	28	7.61	+31	17.63	18.94	1.31
23	9.28	76	59	2.98	74	28	6.30	+31	17.75	18.86	1.11
24	9.69	76	59	3.04	74	28	6.65	+31	17.70	18.86	1.16
25	6.73	80	30	2.43	76	28	4.30	+ 2	18.32	18.89	.57
26	6.77	74	15	2.82	81	28	3.95	—13	17.54	18.12	.58
27	7.00	80	30	2.55	76	28	4.45	+ 2	18.47	19.26	.79
28	8.70	81	36	2.44	77	22	6.26	+14	17.45	18.50	1.05
29	6.83	78	21	3.03	74	33	3.80	—12	20.08	20.80	.72

CHART No. II

Comparison of Experimental vs. Calc. "Oven Dry" Cotton %'s (Using Both Graphs I and II)

M.R. Moisture Regain. O.D.—Oven Dry.
R.H.—Relative Humidity.

	1 *"In Air"* Cotton %	2 *Exp. Oven Dry Cotton %*	3 *Calc. % Oven Dry Using M.R.*	4 *Calc. % Oven Dry Using R.H.*
SAMPLE BLENDS				
1	20.83	21.65	21.69	21.49
2	18.15	18.58	18.61	18.81
3	20.17	20.67	20.56	20.59
4	19.03	19.74	19.71	19.67
5	16.33	17.02	17.09	17.03
6	18.23	18.77	18.79	18.98
7	18.50	19.38	19.29	19.21
8	14.08	14.94	15.07	15.05
9	18.20	19.42	19.40	19.14
10	17.58	18.42	18.45	18.68
11	17.18	18.00	18.05	17.88
CARD ROVINGS				
1	15.05	16.38	16.56	16.09
2	15.95	16.86	16.85	16.54
3	17.94	18.60	18.55	18.37
4	16.85	17.20	17.20	17.11
5	19.89	20.56	20.51	20.43
6	22.28	23.25	23.09	23.18
7	18.62	19.08	19.07	19.28
8	18.10	18.89	19.58	19.00
9	19.08	19.71	19.71	19.83
10	17.85	19.20	19.18	18.60
11	17.68	18.74	18.74	18.56
12	16.88	17.18	17.23	17.54
13	18.20	19.15	19.16	18.84
14	16.00	16.42	16.51	16.71
15	19.68	21.10	21.00	20.62
16	18.63	19.09	19.12	19.34
17	20.00	20.18	20.21	20.80
18	14.78	15.18	15.29	15.48
19	18.45	18.83	18.85	19.15
20	18.90	19.39	19.40	19.60
21	17.30	18.20	18.22	18.55
YARNS				
1	18.30	19.04	18.89	19.12
2	17.10	17.73	17.78	17.85
3	16.85	17.07	17.08	17.44
4	19.45	19.70	19.72	20.16
5	18.46	19.12	19.15	19.08
6	17.45	18.12	17.97	18.16
7	16.28	16.59	16.66	16.99
8	17.19	17.59	17.83	17.89
9	16.80	17.42	17.38	17.50
10	18.20	19.15	19.12	18.90
11	17.50	18.38	18.36	18.22
12	17.63	18.42	18.43	18.35
13	17.59	18.58	18.56	18.46
14	17.40	18.14	18.16	17.89
CLOTH				
1	18.28	19.22	19.25	19.26
2	18.04	19.19	19.15	18.91
3	19.07	20.05	20.00	19.94
4	17.80	18.79	18.82	18.67
5	18.06	18.97	18.96	18.66
6	17.79	18.58	18.61	18.75
7	17.45	18.34	18.37	18.49
8	16.86	17.66	17.71	17.45
9	19.23	19.67	19.67	19.82
10	17.16	18.09	18.12	17.88
11	15.72	16.44	16.67	16.56
12	17.99	19.21	19.01	18.88
13	18.80	19.64	19.61	19.69
14	18.90	19.78	19.76	19.79
15	19.23	19.92	19.89	19.92
16	18.80	19.59	19.56	19.60
17	19.22	20.05	20.03	20.02
18	17.05	17.77	17.87	17.85
19	18.43	19.24	19.17	19.23
20	17.50	18.29	18.34	18.30
21	18.69	19.35	19.36	19.04
22	17.63	18.94	18.94	18.88
23	17.75	18.86	18.84	19.00
24	17.70	18.86	18.85	18.95
25	18.32	18.89	19.08	19.06
26	17.54	18.12	18.24	18.03
27	18.47	19.26	19.26	19.21
28	17.45	18.50	18.54	18.41
29	20.08	20.80	20.76	20.59

individually almost negligible, but because of their number and the possibility of their causing deviations in the same direction, the resulting deviation may be fairly large. In a few cases we have rather large deviations from the straight line.

To use graph II, locate on the vertical coordinate the difference between the relative humidities at the time of the "in air" original and residue weighings. The sign of this difference (+ or —) must be considered. From this point move horizontally to the right to the straight line through the plot, then drop vertically to the horiozntal coordinate. Read here the difference between the "oven dry" and "in air" cotton per cents. This value is added to the "in air" per cent to obtain the calculated "oven dry" result. The equation for this line may be used instead of the graph. The equation is as follows:

$$\% \text{ (o.d.—i.a.)} = \frac{1}{58} (RH_o - RH_r + .72$$

o.d. = "oven dry" cotton %
i.a. = "in air" cotton %
RH_o = relative humidity at original "in air" weighing
RH_r = relative humidity at residual "in air" weighing

The equation is valid between relative humidity differences of — 30 and + .40. In chart II are shown in the RH calc. column (No. 4) the "oven dry" values computed using the graph. In most cases the calculated figures agree well with the actual "oven dry" cotton per cents.

DISCUSSION OF RESULTS

In chart II the data has been separated according to type of sample tested. This separation gave us the four groups, sample blends, card rovings, yarns, and finished cloth. Our purpose was to see which type sample showed the most consistent agreement between calculated (considering graph II only) and actual "oven dry" cotton per cents. We found the best agreement in the cloth sample group. The average deviation was .124 from the actual "oven dry" cotton per cent which based on 20 per cent cotton as ideal, is an average deviation of .62 per cent. The poorest agreement occurred in the card rovings groups. Here the average deviation was .277 which is 1.39 per cent on the 20 per cent maximum. The only large differences were in this group. There was one difference of .62 on the high side of the actual "oven dry" per cent and one of .60 on the low side.

In finding the "oven dry" cotton per cent experimentally at least two tests were used so as to have check results.

Often differences of .2, .3 and even as much as .5 (as per cents) occurred, between the two results. Therefore, the actual "oven dry" figures, which were an average of these sets of tests, have deviations of 0 to .25 from each of the average values. This variation from test to test on the sample greatly affects most of the differences between the calculated and actual "oven dry" cotton per cents.

SUMMARY

This graphical method is now being used for the routine control of lining cloth going through the plant. This means that early results are arrived at now which give a cotton content of acceptable accuracy. Should the 20 per cent maximum be exceeded with the calculated "oven dry" value, reference can be made to the old method as a means to check.

It must be remembered that the graphs and the equation apply only to a 20 per cent cotton-80 per cent wool blend. If the composition were changed considerably, a new relationship would have to be established from data collected from the testing of that particular blend.

REFERENCES

[1]Federal Specifications Bulletin CCCT-191a.
[2]Skinkle, John H., Textile Testing, page 189, Chemical Publishing Co.
[3]American Wool Handbook, Chapt. XXI, page 698, 1st edit., Amer. Wool Handbook Co.
[4]Haven, Handbook of Industrial Fabrics, Appendix III, page 665, Wellington Sears Co.
[5]Matthews, J. Merritt, The Textile Fibers, pages 943-947, John Wiley & Sons.
[6]Walker, A. C., Drying of Textiles, Textile Research March 6, 1943.

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Natural Dye Substitutes

A Bibliography

A. E. KARR

A section of the bibliography published on pages 241 and 242 of the May 24 edition of the Dyestuff Reporter was inadvertently omitted. The following section follows the item entitled—Transactions of the Journal of the Chemical Soc. of London, v. 97, p. 220. A natural Substantive Dyestuff—Arthur George Perkin, 1910.

U. S. Forest Service Bulletin 83, U. S. Dept. of Agriculture, The Forest Resources of the World—Raphael Zon, 1910.

Flore Génèrale de l'Indo-Chine—M. H. Lecomte—1910-31.

Chemical Soc. of London Transactions Journal, vol. 101, Part 1, p. 1061, Researches on Santalin—J. C. Cain and J. L. Simonsen.

A Dictionary of Applied Chemistry, vol. 2—Sir Edward Thorpe, 1912.

Journal of the Chemical Soc. of London Transactions, vol. 103, Part 1, p. 650, Gossypetin—Arthur Perkin, 1913.

Index Kewensis

Pädagogisches Magazin, Heft 576, Die Flora des Sudamerikinischen Urwaldes—Karl Trautermann, 1914.

Journal of the Chemical Soc. of London Transactions, vol. 105, p. 559, Constituents of Solanum angustifolium—Frank Tutin and H. W. B. Clewer, 1914.

Journal of the Chemical Soc. of London Transactions, vol. 105, p. 1335, Researches on Santalin—J. C. Cain, J. L. Simonsen, Clarence Smith, 1914.

Java—Donald Maclaine Campbell, 1915.

Museum Nacional do Rio Janeiro, vol. 19, Archivos, A flora de Mattogrosso—Prof. A. J. de Sampaio, 1916.

Journal of the Chem. Soc. of London Transactions, vol. 113, Camwood, Barwood and Sanderswood—Pauline O'Neill and Arthur Geo. Perkin, 1918.

Needle and Bobbin Club Bulletin, vol. 2, No. 2, pp. 3-11, Medieval Dyestuffs—Charles E. Pellew, 1918.

Journal of the Chem. Soc. of London Transactions, v. 113, p. 766, Morindone—John L. Simonsen, 1918.

Natural Organic Coloring Matters—Arthur Geo. Perkin, 1918.

Peruvians of Today, Edited by Wm. Belmont Parker, 1919.

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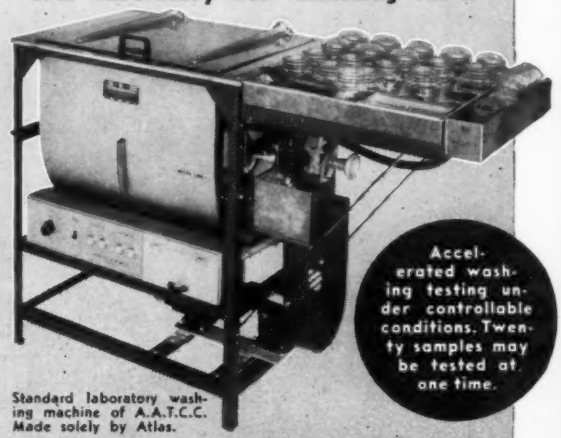

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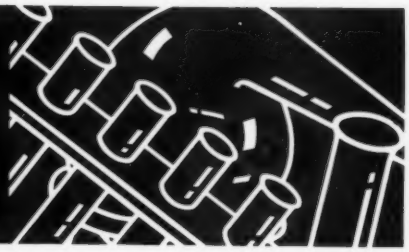

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Additional Classifieds Appear on page 314

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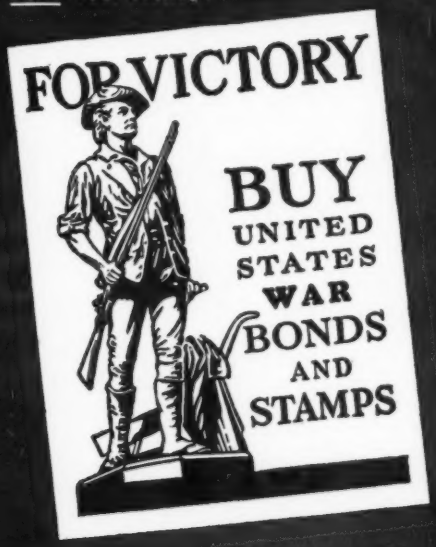

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TO HIT 'EM H-A-R-D-E-R

THE year 1943 promises to be the grimmest, hardest year this country has ever faced. Every effort, and every dollar of national income not absolutely needed for existence, should go into war work and War Bonds.

In the Pay Roll Savings Plan, America finds a potent weapon for the winning of the war—and one of the soundest guarantees of the preservation of the American way of life!

Today about 30,000,000 wage earners, in 175,000 plants, are buying War Bonds at the rate of nearly half a billion dollars a month. *Great as this sum is, it is not enough!* For the more dollars made available now, the fewer the lives laid down on the bloody roads to Berlin and Tokio!

You've undoubtedly got a Pay Roll Savings Plan in your own plant. But how long is it since you last checked up on its progress? *If it now shows only about 10% of the gross payroll going into War Bonds, it needs jacking up!*

This is a *continuing* effort—and it needs *continual* attention and *continual* stimulation to get fullest results.

You can well afford to give this matter your close personal attention! The actual case histories of thousands of plants prove that the successful working out of a Pay Roll Savings Plan gives labor and management a common interest that almost inevitably results in better mutual understanding and better labor relations.

Minor misunderstandings and wage disputes become fewer. Production usually increases, and company spirit soars. And it goes without saying that workers with substantial savings are usually far more satisfied and more dependable.

And one thing more, these War Bonds are not only going to help win the war, they are also going to do much to close the dangerous inflationary gap, and help prevent post-war depression. The time and effort *you* now put in in selling War Bonds and teaching your workers to save, rather than to spend, will be richly repaid many times over—now and when the war is won.

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MANUFACTURING CHEMISTS FOR THE TEXTILE INDUSTRY

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DON'T BE PENNY-WISE AND TON-FOOLISH ABOUT SCRAP!

IT'S easy to salve your salvage conscience by turning in the junk you'd been meaning to get rid of. *But this is not enough!* To end the shortage of heavy steel scrap you've got to dig deeper. Mills are going to need about 26,000,000 tons of purchased scrap this year! To make sure that the men we've sent to war will have the weapons they need, you've got to get rid of every piece of idle "slacker" metal in your plant. Don't hang on to something, just because you may need it some time next year or after the war. Sell it—either as scrap or as second hand equipment.

CAN'T GET ENOUGH COPPER

Shortest of all is copper, and officials say this critical shortage will continue for the duration. Copper refineries are not operating at full capacity . . . when they should be running wide open! Who knows how long that one scarcity may delay the final big push?

So round up that copper scrap. Brass and bronze, too. And here's a tip—don't throw it all helter-skelter on one pile. It takes too long to sort, and in addition, you're likely to get a price equal to the lowest grade in the pile. Don't just separate different metals . . . it's to your advantage to *segregate* them by alloys, if you possibly can.

RUN YOUR SCRAP PROGRAM ACCORDING TO THIS RULE:

If it hasn't been used for three months, and if some one can't prove that it's going to be used in the next three—sell it—or scrap it! Scrap and used equipment dealers pay well for usable machinery and materials.

DEDUCT VALUE FROM YOUR INCOME TAX

Remember . . . if the item you scrap still appears on your books, it can be deducted. Otherwise it cannot. This is a matter for your accountant or attorney to decide. Even if not deductible, don't hoard it. For used machinery especially there's a big and continuing demand. *Somebody needs it—badly!*

It all boils down to this . . . if you hang on to tons of good steel . . . if you refuse to part with useless machinery . . . you're being a scrap slacker!

You're putting pennies before patriotism and making it just that much harder for us to win the war.

GET TOUGH AND CLEAN UP

Make your scrap program a continuous effort. Put a go-getter in charge of it . . . somebody with real authority. Have him go through the plant at regular intervals with a piece of chalk or can of paint and mark what's to go. Whether it's junk or usable equipment, you'll get a fair price for it. And you'll get the warm feeling of having done something *extra* for victory!

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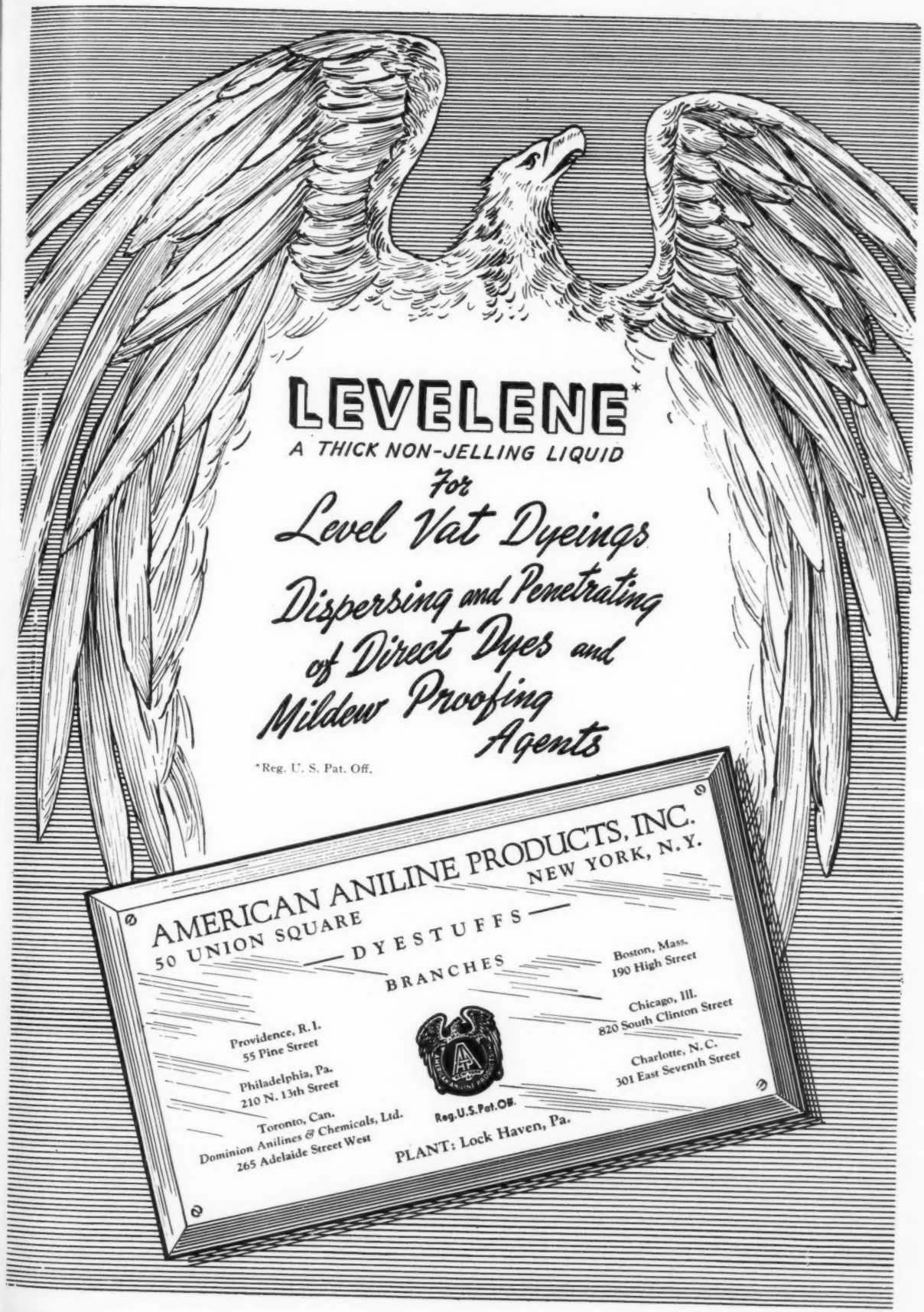
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